

RESEARCH IN NEPALESE MANAGEMENT

Volume-I

Edited by:

Dr. Radhe Shyam Pradhan

Professor (Retired) Central Dept. of Mgmt., Tribhuvan University, Academic Director,
Uniglobe College; & Fulbright Visiting Faculty, Florida State University.

Dr. Nar Bahadur Bista

Chairman and Principal, Uniglobe College

Dr. Gangadhar Dahal

Managing Director, Uniglobe College

&

Mr. Sumit Pradhan

Head, Research Department, Uniglobe College

Uniglobe College,

New Baneshwor, Kathmandu, Nepal

Phone: 977-1-4115569, 4115690

Website: www.uniglobe.edu.np | Email: mail@uniglobe.edu.np

Research in Nepalese Management www.uniglobe.edu.np/ publication

Edited by Prof. Dr. Radhe Shyam Pradhan, Dr. Nar Bahadur Bista, Dr. Gangadhar Dahal and Sumit Pradhan

Contributors

Prof. Dr. Radhe Shyam Pradhan, Dr. Nar Bahadur Bista, Dr. Gangadhar Dahal Sumit Pradhan, Anuj Ghimire, Usha Acharya, Mahalaxmi Chaudhary, Prashant Chaudhary, Sewak Khadka, Aashiyana Karki, Puja Jha, Joshila Dahal, Monika Bhatta, Puja Sah, Saroj Magar, Sagar Nath Pant, Yubraj Ojha, Rahul Shakya, Manisha Kshatry, Bivek Kumar Yadav, Suman Paudel, Jamuna Giri, Drispa Kunwar, Susant Paudel, Jharana Regmi, Shreeshma Shikhrakar, Ramesh Rawat, Pankaj Chand, Samundra Bhandari, Kaushiki Pant, Shweta Poudel, Shovita Adhikari, Apsara Imam, Susmita Kasaudhan, Mahesh Joshi, Raman Silwal, Rohit Khadka, Priya Pradhan, Amrit Kandel and Astha KC.

Published by

Uniglobe College, New Baneshwor, Kathmandu, Nepal

Phone: 977-1-4115569, 4115690

Website: www.uniglobe.edu.np | Email: mail@uniglobe.edu.np

© The Editor(s) and the Author(s) 2025

The moral rights of the editor(s) and the author(s) have been asserted. All rights to the book as a whole are reserved by Uniglobe College. The book as a whole (compilation) cannot be reproduced, distributed or used for commercial or non-commercial purposes without Uniglobe College's written permission. Enquiries concerning the use of the book should be directed to Uniglobe College's rights and permissions department (publication@uniglobe.edu.np). Violations are liable to prosecution under the governing Copyright Law. Individual chapters of this publication are distributed under License which permits commercial use, distribution and reproduction of the individual chapters, provided the original author(s) and source publication are appropriately acknowledged.

Notice: Statements and opinions expressed in the chapters are those of the individual contributors and not necessarily those of the editors or publisher. No responsibility is accepted for the accuracy of information contained in the published chapters. The publisher assumes no responsibility for any damage or injury to persons or property arising out of the use of any materials, instructions, methods or ideas contained in the book.

Printed in :

Price: Rs. 2000/-

Design & Layout: Mr. Dipesh B.K., IT Officer, Uniglobe College

Additional hard copies can be obtained from www.uniglobe.edu.np. Research in Nepalese Management, Editors: Prof. Dr. Radhe Shyam Pradhan, Dr. Nar Bahadur Bista, Dr. Gangadhar Dahal and Sumit Pradhan.

ISSN: 3059-989X (Print)

MEET THE EDITORS

Prof. Dr. Radhe Shyam Pradhan is Professor, Tribhuvan University, Central Dept. of Mgmt., Kirtipur, Nepal who got retired after teaching for about 38 years. He was a Fulbright Visiting Faculty to College of Business, Florida State University, Tallahassee, Florida, USA and currently, he is working as an Academic Director, Uniglobe College (Pokhara University Affiliate), Kathmandu, Nepal. He also completed a one-year course under Faculty Development Program at the Indian Institute of Management, Ahmedabad, India. He completed Ph. D. from Delhi University, Delhi, India. He has published 156 articles in different national and international journals. He is also the author 13 books, of which 4 of them have been published from India and the rest from Nepal. He has supervised about 2 dozen of Ph. D. Dissertations of Universities in Nepal and India. He has also supervised more than 10 dozen of M.Phil. Dissertations of Universities in Nepal. He has served as Key Note Speaker, Chief Guest, Guest of Honor & Resource Person in 95 int'l seminars & conferences. He has examined more than 4 dozen of Ph. D. & D. Litt. dissertations of Universities in India and abroad. He has got an experience of working as a consultant in 33 projects funded by national and international organizations like UNDP, ADB and World Bank. He has visited Bangladesh, Bhutan, Czech Republic, China, France, Germany, Hungary, India, Italy, Japan, Malaysia, Poland, Singapore, Slovakia, Thailand, UK & USA.



Dr. Nar Bahadur Bista is the Chairman/ Principal of Uniglobe College. He is a Board Director of Professional Educators Limited (Proed Ltd.), Valley View English School, Global College International and Uniglobe Higher Secondary School. He is also a Former Principal of Global College of Management and Former Managing Director of Professional Educators Limited. Dr. Bista did Ph.D. in Economics from University of Warsaw, Poland. He has attended many academic courses and trainings in Nepal and abroad. He attended a Summer School on Econometrics at Cambridge University, London, UK in 2013. He attended training for College Management from Indian Institute of Management (IIM), Ahmadabad, India in 2011. He also participated in a training on Environmental Economics at Asian Institute of Technology (AIT), Bangkok, Thailand in 2009. He has presented research papers in international conferences held in Venice, Italy; Texas, USA; Berlin, Germany; Warsaw, Poland; London, UK; and many other places. He has a teaching experience in Economics, Research Methodology and Economic Policy Analysis since 1999 in various academic institutions. He is also an author and co-author of text books in Economics. He has published many research articles from national and International Journals and Magazines.



Dr. Gangadhar Dahal is the Managing Director and was the former Principal and Executive Director at Uniglobe College. He did Ph.D from University of Warsaw, Poland. He received M.Sc. in statistics from the Tribhuvan University and MA, M.Phil in economics from Tribhuvan University. Dr. Dahal has been teaching in the Public Youth Campus of Tribhuvan University for last 14 years. Dr. Dahal is the Chairman of Valley View English School. He is the author and co-author of various books in economics subject area. He has conducted many published and unpublished research works



Mr. Sumit Pradhan is the Head of Research Department at Uniglobe College. He received MBA in Finance from Uniglobe College affiliated to Pokhara University. Mr. Pradhan has been teaching Research Methodology, Corporate Finance, and Financial Derivatives in Uniglobe College for last 5 years. He has published 5 articles in international journals and 11 articles in national Nepali journals. He has supervised more than 12 dozens of MBA graduate research reports of Pokhara University.



PREFACE

In today's rapidly evolving business landscape, the field of management has become increasingly complex, requiring a multidimensional approach to decision-making in finance, economics, marketing, human resource management, and operations. The interplay among these disciplines is crucial for the growth and sustainability of businesses, particularly in emerging economies like Nepal. However, the dynamic and unpredictable business environment, characterized by intense competition, technological advancements, regulatory changes, and economic fluctuations, present significant challenges for Nepalese organizations. In recent years, Nepalese businesses have encountered persistent issues related to financial stability, workforce management, market expansion, and operational efficiency. Firms struggle to maintain liquidity and cash flow, especially during economic downturns. At the same time, rapidly shifting consumer behaviors and digital transformation have necessitated innovative marketing strategies to sustain brand positioning. Similarly, attracting, retaining, and managing human resources in a competitive job market remain critical challenges. Additionally, political instability, regulatory hurdles, and inadequate infrastructure have further complicated business operations, making strategic decision-making a difficult task.

One of the primary motivations for coming up with this book is to bridge the gap between theory and practice of management in Nepalese organizations. Despite significant advancements in management theories in the developed economies, their direct applicability is yet to be seen in an emerging economy like Nepal due to the unique socio-economic, cultural, and institutional structures of the country. The business environment in emerging markets like Nepal is shaped by distinct financial, legal, technological, and human resource dynamics that require context specific strategies and policies. This book aims to provide scholars, policymakers, business leaders, and management practitioners with valuable insights into contemporary research in Nepalese management. By addressing key themes such as organizational behavior, financial management, marketing strategies, digital transformation, entrepreneurship, and corporate governance, this book seeks to highlight the evolving trends and challenges in Nepal's business sector. Through evidence-based research and case studies, it offers a comprehensive understanding of the critical factors influencing business performance in Nepal. We hope that this book will serve as a useful resource for academicians, researchers, and practitioners, inspiring further discussions and studies on Nepalese management. By fostering a deeper understanding of the unique challenges and opportunities in Nepalese business, we aim to contribute to the development of more effective and contextually relevant management practices.

Ghimire and Pradhan examine the effect of operating expenses on the profitability of Nepalese commercial banks. It shows how operating expenses, inflation, loan loss provision, bank size, and capital adequacy ratio affect the profitability. Acharya examines the factors determining stock price of Nepalese commercial banks. It offers insights into how dividend per share, earnings per share, price to earnings ratio, lending rate, inflation rate and dividend yield affect market price per share and change in market price per share. Chaudhary analyzes the effect of capital adequacy ratio, third party funds, loan to deposit ratio and bank size on profitability

of Nepalese commercial banks. It indicates how capital adequacy ratio, third party funds, loan to deposit ratio and bank size, number of branches and loan to asset ratio affect return on assets and return on equity. Similarly, Chaudhary investigates the impact of interest rate spread, capital adequacy, credit risks, deposit growth and ownership structure on profitability of Nepalese commercial banks. It shows how interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, and institutional ownership affect profitability of Nepalese commercial banks. Khadka examines the effect of intangible assets on the profitability of Nepalese commercial banks. It offers insights into how capital adequacy ratio, total loans, intangible assets, non-performing loan, total assets, and total deposit affect the profitability.

Moreover, Karki examines the effects of sectoral factors on the profitability of Nepalese commercial banks. It offers insights into how operational efficiency, capital adequacy ratio, liquidity, non-performing loans, debt to assets, loan loss provision, and bank size affect profitability. Jha and Pradhan examine the impact of financial risk and capital adequacy ratio on the profitability of Nepalese commercial banks. It shows how bank size, non-performing loan, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage affect return on assets and return on equity. Dahal examines the impact of capital structure, firm size, sales growth, and asset tangibility on the profitability of Nepalese commercial banks. It indicates how debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size affect profitability. Bhatta investigates the effect of gender diversity, net interest margin, loan to deposit ratio and operating efficiency on profitability of Nepalese commercial banks. It offers insights into how capital adequacy ratio, board size, net interest margin, loan to deposit ratio, operating efficiency and gender diversity affect profitability. Sah examines impact of credit risk, operational risk and liquidity risk on profitability of Nepalese commercial banks. It shows how capital adequacy ratio, credit-to-deposit ratio, non-performing loans, operational efficiency, loan loss provisions, and leverage affect return on assets and return on equity of Nepalese commercial banks. Magar examines the effect of CAMEL analysis on the profitability of Nepalese commercial banks. It offers insights into how capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio and loan to deposit ratio affect return on assets and return on equity.

In addition, Pant examines the determinants of the solvency in insurance companies of Nepal. It indicates how liquidity, company size, company age, volume of assets, claim ratio, and premium growth affect solvency in insurance companies. Ojha analyzes the role of accounting information to investors in the stock market. It shows how earnings per share, dividend per share, return on equity, book value per share, net profit margin and return on asset affect stock return and stock price of the companies. Shakya investigates the impact of liquidity management and non-performing loan on the performance of Nepalese commercial banks. Specifically, it examines the relationship of liquidity ratio, non-performing loan, loan to deposit ratio, capital adequacy ratio, loan loss provision and bank size affect financial performance. Further, Kshatry examines the relationship among credit risk, liquidity risk and profitability of Nepalese commercial banks. It offers insights into how liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing loan, and capital

adequacy ratio affect profitability. Yadav examines the impact of capital adequacy ratio, non-performing loans, loan deposit ratio and beta on the profitability of Nepalese commercial banks. It indicates how non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size affect return on assets and return on equity. Paudel investigates the factors affecting IPO underpricing in Nepal. It offers insights into how issue price, issue size, age of the firm, firm size, and earning per share affect IPO underpricing.

Giri examines the impact of brand image on consumer satisfaction and loyalty of various brands in Kathmandu Valley. It shows how brand personality, brand image, perceived quality, value proposition, brand awareness and brand association affect consumer satisfaction and consumer loyalty. Kunwar investigates the factors influencing customers' bank selection decision in Nepalese commercial banks. It offers insights into how excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image affect customers' bank selection decision. Paudel analyzes the impact of service quality dimensions on customer satisfaction and loyalty in Nepalese commercial banks. It indicates how flexibility, reliability, responsiveness, empathy and assurance affect customer satisfaction and loyalty. In addition, Regmi examines the impact of behavioral biases on investment decision and strategies of investors in Nepal Stock Exchange. It shows 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.

Shikhrakar and Rawat examine the impact of social media marketing on consumer buying behavior in Nepalese fashion industry. It offers insights into how content quality, product quality, social media engagement, brand trust, advertisement frequency and influencer endorsement affect consumer buying behavior in fashion industry. Chand investigates the impact of customer relationship management on customer satisfaction and retention in the context of Nepalese enterprises. It indicates how service quality, employees' behavior, complaint handling, interaction management and customer focus affect customer satisfaction and retention. Likewise, Bhandari examines the influence of information technology on consumer decision-making in Kathmandu Valley. It offers insights into how digital advertisement, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth affect consumer decision making. Pant analyzes the existence of overconfidence biases among Nepalese investors and its impact on investment decisions. It indicates how over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion affect investment decision. Poudel investigates the impact of social media marketing on customer engagement in Kathmandu Valley. It indicates how customization, trust, product quality, customer awareness, content marketing, and attractiveness affect consumer engagement.

Adhikari determines the relationship between job satisfaction and turnover intention in Nepalese service sector. It offers insights into how job stress, supervisor relationship, compensation, career development and work life balance affect employee job satisfaction and turnover intention in service sector. Imam analyzes the effect of pay for performance on employee work attitude in the context of Nepalese commercial banks. It shows how bonus pay, merit pay,

incentive pay, employee share ownership, promotion and performance evaluation fairness affect employee performance and job satisfaction. Moreover, Kasaudhan examines the effect of training dimensions on employee work performance in Nepalese manufacturing sector. It indicates how training period, trainer behavior, training workplace, training design and training evaluation affect employee work performance.

Joshi analyzes the firm specific and macro-economic determinants of stability in Nepalese commercial banks. It offers insights into how capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate affect Z-score and non-performing loan. Silwal and Bista analyzes the effect of macro-economic variables on the stock returns in the context of Nepalese insurance companies. It indicates how inflation, gross domestic products, interbank rate, money supply, per capita income and remittance affect price to earnings ratio and capital gain yield. Khadka and Dahal investigates the impact of GDP and other macroeconomic factors on performance of Nepalese stock market. It shows how gross domestic product, inflation, interest rate, exchange rate, gold price and FDI affect NEPSE Index and Sensitive Index. Similarly, Pradhan examine the effect of interest rate spread on profitability of Nepalese commercial banks. . It offers insights into how interest rate spread, net interest margin, non-performing loan, capital adequacy ratio, inflation rate, and gross domestic product affect profitability. Kandel investigates the effect of bank dynamics, bank risks and macroeconomic factors on capital structure decisions of Nepalese commercial banks. S It offers insights into how bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth affect capital structure decisions. Further, KC assesses the impact of interest rate, monetary policy, liquidity and non- interest income on loans and deposits of Nepalese commercial banks. It indicates how interest rate, capital adequacy ratio, cash reserve ratio, liquidity, non- performing loan and non-interest income affect loan to deposit and loan to asset.

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 seventeen studies on financial management, nine studies on marketing, three studies on human resource management and six studies on economic environment and policy 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.

March 2025

Dr. Radhe Shyam Pradhan

Professor

Central Dept. of Mgmt., Tribhuvan University;

Academic Director, Uniglobe College; &

Fulbright Visiting Faculty, Florida State University.

Dr. Nar Bahadur Bista

Chairman / Principal , Uniglobe College

Dr. Gangadhar Dahal

Managing Director, Uniglobe College

&

Mr. Sumit Pradhan

Head, Research Department, Uniglobe College

CONTENTS

Chapter 1: Effect of operating expense on the profitability of Nepalese commercial banks	
- Anuj Ghimire and Prof. Radhe Shyam Pradhan.....	12
Chapter 2: Determinants of market stock price movements: A case of Nepalese commercial banks	
- Usha Acharya.....	24
Chapter 3: Effect of capital adequacy ratio, third party funds, loan to deposit ratio and bank size on the profitability of Nepalese commercial banks	
- Mahalaxmi Chaudhary.....	38
Chapter 4: Impact of interest rate spread, capital adequacy, credit risks, deposit growth and ownership structure on the profitability of Nepalese commercial banks	
- Prashant Chaudhary	50
Chapter 5 : Effect of intangible assets on the profitability of Nepalese commercial banks	
- Sewak Khadka.....	66
Chapter 6: Effects of banking sectoral factors on profitability of Nepalese commercial banks	
- Aashiyana Karki.....	80
Chapter 7: Impact of financial risk and capital adequacy ratio on the profitability of Nepalese commercial banks	
- Puja Jha and Sumit Pradhan.....	97
Chapter : Impact of capital structure, firm size, sales growth, and asset tangibility on profitability of Nepalese commercial banks	
- Joshila Dahal.....	111
Chapter 9: Impact of gender diversity, net interest margin, loan to deposit ratio and operating efficiency on profitability of Nepalese commercial banks	
- Monika Bhatta.....	129
Chapter 10: Impact of credit risk, operational risk and liquidity risk on profitability of Nepalese commercial banks	
- Puja Sah.....	143
Chapter 11: A CAMEL Model Analysis of Nepalese Public, Private and Joint Venture commercial banks	
- Saroj Magar.....	157
Chapter 12: Determinants of the solvency in insurance companies of Nepal	
- Sagar Nath Pant.....	170
Chapter 13: Role of accounting information to investors in the stock market: A case of Nepal	
- Yubraj Ojha.....	183
Chapter 14: Impact of liquidity management and non-performing loan on the performance of Nepalese commercial banks	
- Rahul Shakya.....	196
Chapter 15: Relationship among credit risk, liquidity risk and profitability of Nepalese commercial banks	
- Manisha Kshatry.....	211
Chapter 16: Impact of non-performing loans, capital adequacy ratio, beta and loan to deposit ratio on profitability of Nepalese commercial banks	
- Bivek Kumar Yadav.....	225
Chapter 17: Factors affecting IPO Underpricing in Nepal	
- Suman Paudel.....	241

Chapter 18: Impact of brand image on consumer satisfaction and loyalty: A case of Kathmandu Valley	
- Jamuna Giri.....	253
Chapter 19: Factors influencing customers' bank selection decision: A case of Nepalese commercial banks	
- Drispa Kunwar.....	266
Chapter 20: Impact of service quality dimensions on customer satisfaction and customer loyalty in Nepalese commercial banks	
- Susant Paudel.....	277
Chapter 21: Impact of behavioral biases on investment decision and strategies of investors in Nepal Stock Exchange	
- Jharana Regmi.....	288
Chapter 22: Impact of social media marketing on consumer buying behavior in Nepalese fashion industry	
- Shreeshma Shikhrakar and Ramesh Rawat.....	301
Chapter 23: Impact of customer relationship management on customer satisfaction and retention: A case of Nepalese enterprises	
- Pankaj Chand.....	312
Chapter 24: Influence of information technology on consumer decision-making in Kathmandu Valley	
- Samundra Bhandari.....	324
Chapter 25: A study on existence of overconfidence biases among Nepalese investors and its impact on investment decision	
- Kaushiki Pant.....	335
Chapter 26: Influence of social media marketing on customer engagement in Kathmandu Valley	
- Shweta Poudel.....	349
Chapter 27: Relationship between job satisfaction and turnover intention in Nepalese service sector	
- Shovita Adhikari.....	360
Chapter 28: Effect of pay for performance on employee work attitude: A case of Nepalese commercial banks	
- Apsara Imam.....	372
Chapter 29: The effect of training dimensions on employee work performance in Nepalese manufacturing sector	
- Susmita Kasaudhan.....	386
Chapter 30: Firm specific and macroeconomic determinants of stability in Nepalese commercial banks	
- Mahesh Joshi.....	397
Chapter 31: Impact of macroeconomic variables on stock returns in Nepalese insurance companies	
- Raman Silwal and Dr. Nar Bahadur Bista.....	410
Chapter 32: Impact of gross domestic product on the Nepalese Stock Market	
- Rohit Khadka and Dr. Gangadhar Dahal.....	422
Chapter 33: Effect of interest rate spread on profitability of Nepalese commercial banks	
- Priya Pradhan.....	435
Chapter 34: Effect of bank dynamics, bank risks and macroeconomic factors on capital structure decisions of Nepalese commercial banks	
- Amrit Kandel.....	448
Chapter 35: Impact of interest rate, monetary policy, liquidity and non- interest income on loans and deposits of Nepalese commercial banks	
- Astha KC.....	463

Chapter 1

Effect of Operating Expense on the Profitability of Nepalese Commercial Banks

Anuj Ghimire and Prof. Radhe Shyam Pradhan*

Abstract

This study examines the impact of operating expenses on the profitability of Nepalese commercial banks. Return on assets and return on equity are the selected dependent variables. The selected independent variables are loan loss provision, operational efficiency, capital adequacy ratio, bank size, and inflation. 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) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of loan loss provision, operational efficiency, capital adequacy ratio, bank size, and inflation 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 and return on equity. It means that increase in capital adequacy ratio leads to increase in return on assets and return on equity. 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. It shows that higher the operational efficiency ratio, lower would be the return on assets. Moreover, inflation has a negative impact on return on assets and return on equity. It indicates that increase in inflation leads to decrease in return on assets and return on equity. However, operational efficiency has a positive impact on return on equity. It shows that higher the operational efficiency ratio, higher would be the return on equity.

Keywords: return on assets, return on equity, loan loss provision, operational efficiency, capital adequacy ratio, bank size, inflation

1. Introduction

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. A robust financial

* Mr. Ghimire is a Freelance Researcher, Kathmandu, Nepal and Prof. Pradhan is the Academic Director, Uniglobe College (Pokhara University affiliate), Kathmandu, Nepal.

system is essential for facilitating growth and reducing vulnerability to crises within commercial banks. The stability of the financial system is a catalyst for economic growth, as it facilitates the exchange of value (Abubakar and Gani, 2013). Furthermore, a high level of bank capital instills confidence and trust in the public regarding the bank's soundness. A strong profitability position indicates a bank's ability to earn profits and make a significant contribution to the economic growth of a country (Akter and Mahmud, 2014).

Operational efficiency refers to the effectiveness, competence, and skill of a company's management team in making strategic decisions, allocating resources, setting goals, and implementing operational processes. Good management is often associated with efficient and well-organized operations, effective risk management, and a strong focus on achieving the company's objectives. Boateng (2019) defined operating expenses as the cost's banks incur in their day-to-day operations, such as employee salaries, rent, utilities, marketing, and administrative costs. These expenses are subtracted from a bank's revenue to calculate operating income or profit. Shuremo (2016) found that if a bank effectively manages its operating expenses and keeps them low, it can improve its profitability. By reducing costs, banks can increase their operating income and, ultimately, their net profit. This can be achieved through various means, such as optimizing operational processes, negotiating better deals with suppliers, or implementing cost-saving measures (Sapa and Awaluddin, 2022). Banks must strike a balance between managing operating expenses and providing quality services to customers. While reducing expenses is beneficial, it should not come at the expense of customer satisfaction or the bank's ability to compete in the market. So, operating expenses have a direct impact on the profitability of banks. By effectively managing these expenses, banks can improve their financial performance and enhance their overall profitability.

A high-quality management team is more likely to implement robust risk management practices, identifying and mitigating potential risks effectively. This can lead to lower credit losses, reduced exposure to bad loans, and a healthier loan portfolio. As a result, the institution may have fewer unexpected losses that could impact its capital position. 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. Operating expenses encompass all the costs incurred by a bank in its day-to-day operations, such as salaries, rent, utilities, marketing expenses, technology costs, and regulatory compliance expenses. These expenses directly affect the bottom line of the bank's financial statements. Higher operating expenses can eat into a bank's revenue, reducing its profitability. Therefore, effective cost management strategies are crucial for banks to maintain profitability. Banks often strive to optimize their operating expenses without compromising the quality of services offered to customers. Banks commonly use a metric called the efficiency ratio to assess their cost management effectiveness. This ratio measures the proportion of a bank's revenue that is consumed by operating expenses. A lower efficiency ratio indicates better cost control and higher profitability (Ariff and Luc, 2008).

According to Siyanbola and Raji (2003), 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. Compliance costs, including

those related to regulatory requirements, can significantly contribute to a bank's operating expenses. While necessary for maintaining legal and regulatory compliance, excessive regulatory burdens can strain a bank's profitability. Managing operating expenses effectively is essential for banks to maintain profitability, remain competitive, attract investors, and ensure long-term sustainability in the financial market (Tsolas, 2011).

Ismaulina and Zulfadhli (2017) found a negative impact of operational efficiency on return on assets. Inefficient operations often lead to higher operating costs. This can result from manual processes requiring more manpower, outdated technology requiring frequent maintenance or replacement, and ineffective risk management leading to losses. These increased costs eat into the bank's revenue, reducing profitability. Inefficiencies can also impact revenue generation. For example, slow transaction processing times and poor customer service can drive customers away to competitors, leading to a loss of business. Additionally, ineffective credit risk assessment processes may result in higher loan defaults, reducing interest income. To increase the performance of the firms, it is necessary to increase the efficiency of the financial institution's management (Athanasoglou *et al.*, 2008). Al Karim and Alam (2013) concluded that operational cost has significant negative impact on the financial performance. Similarly, Yesmine and Bhuiyah (2015) found that assets operating efficiency has significant positive impact on the financial performance of bank. In contrary, Teshome *et al.* (2018) 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.

In the context of Nepal, Khatri (2023) examined the impact of financial ratios, operational efficiency and non-performing loans on the profitability of Nepalese commercial banks. The study showed that operational efficiency has a negative impact on return on asset. It indicates that higher the operational efficiency, lower would be the return on asset. Pradhan and Shrestha (2017) examined the impact of capital adequacy and bank operating efficiency on the financial performance of Nepalese commercial banks. The results indicated that total deposits to total assets and bank operating efficiency were the significant variables determining the financial performance of commercial banks in Nepal. Bank operating efficiency, loan ratio, total deposit to total assets, and loan loss provision to total equity had a significantly positive impact on the financial performance of commercial banks. 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. Sah and Pradhan (2023) analyzed the impact of financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese commercial banks. The study showed that operating efficiency has a negative impact on return on assets and return on equity. It indicates that increase the operating efficiency leads to decrease in return on assets and return on equity of Nepalese commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of operating expenses on bank's 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 major objective of the study is to examine the effect of operating expenses on the profitability of Nepalese commercial banks. More specifically, the study examines the effect of operating expenses, inflation, loan loss provision, bank size, and capital adequacy 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 13 Nepalese commercial banks for the study period from 2015/16 to 2022/23, leading to a total of 104 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 commercial banks	Study period	Observations
1	Siddharth Bank Limited	2015/16 - 2022/23	8
2	Citizens Bank International Limited	2015/16 - 2022/23	8
3	Standard Chartered Bank Nepal Limited	2015/16 - 2022/23	8
4	Himalayan Bank Limited	2015/16 - 2022/23	8
5	Rastriya Banijya Bank Limited	2015/16 - 2022/23	8
6	Prime Commercial Bank Limited	2015/16 - 2022/23	8
7	Everest Bank Limited	2015/16 - 2022/23	8
8	NMB Bank Limited	2015/16 - 2022/23	8
9	Nepal SBI Bank Limited	2015/16 - 2022/23	8
10	Agricultural Development Bank Limited	2015/16 - 2022/23	8
11	Machhapuchchhre Bank Limited	2015/16 - 2022/23	8
12	Sanima Bank Limited	2015/16 - 2022/23	8
13	Prabhu Bank Limited	2015/16 - 2022/23	8
Total number of observations			104

Thus, the study is based on 104 observations.

The model

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

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

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

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 shareholders' equity, in percentage.

LLP = Loan loss provision as measured by the amount of total loan loss provision, Rs. in million.

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

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

INF= Inflation as measured by the change in consumer price index, in percentage.

BS = 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:

Operating efficiency

Operating efficiency, typically measured by metrics such as cost-to-income ratio or efficiency ratio, reflects how well a bank manages its expenses relative to its income. When a bank operates efficiently, it can minimize costs while maximizing revenue, leading to increased profitability (Boateng, 2019). Mehzabin et al. (2023) found that there is significant and positive effect of capital structure, operating efficiency and non-interest income on bank profitability in the context of Asia. Buchory (2015) found a positive association between operating efficiency and bank profitability. Efficiency improvements can result from various factors, including streamlined processes, effective use of technology, optimal staffing levels, and prudent risk management practices. As a bank becomes more efficient, it can enhance its profitability by either increasing its net income or reducing expenses. Moreover, Oral and Yolalan (1990) revealed a direct positive relationship between operating efficiency and bank profitability.

Based on this, this study develops the following hypothesis:

H₁: There is a positive relationship between operating efficiency and bank profitability.

Loan loss provision

Loan loss provision, an essential measure for managing credit risk in the banking sector, has been extensively studied concerning its impact on bank profitability. Several studies have explored this relationship and produced varying results. Alhadab and Alsahawneh (2016) discovered that loan loss provision negatively affects the profitability of Jordanian commercial banks. Ahmad et al. (2014) confirmed this negative relationship between loan loss provision (LLP) and profitability, specifically return on assets (ROA) and return on equity (ROE). In addition, Kaaya and Pastory (2013) utilized panel data analysis to analyze credit risk and performance in Tanzanian commercial banks for the period 2005-2011, concluding that loan loss provision has a negative impact on both return on assets and return on equity. 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. Based on this, this study develops the following hypothesis:

H₂: There is a negative relationship between loan loss provision and bank profitability.

Inflation rate

Batsinda and Shukla (2019) focused on the impact of inflation on the profitability of the Bank of Kigali in Rwanda. The study found that demand-pull inflation and monetary inflation had a negative correlation with the profitability of the Bank of Kigali. Additionally, Tan and Floros (2009) argued that the inflation rate adversely affected financial sector performance through credit market frictions before impacting economic growth. Saeed (2014) examined the Bank-related, industry-related and macroeconomic factors affecting bank profitability of the United Kingdom. The study showed

a negative relationship between inflation rate and bank profitability. Furthermore, Hooshyari and Moghanloo (2015) explored the influence of inflation on banks' profitability in Iran. The study indicated that inflation, along with factors like net interest margin, liquidity, taxation, capitalization, and cost efficiency, has a negative impact on the profitability of banks. Based on this, this study develops the following hypothesis:

H₃: There is a negative relationship between inflation rate and bank profitability.

Bank size

Sufian and Habibullah (2009) examined the determinants of the profitability of the Chinese banking sector during the post-reform period of 2000–2005. The study revealed that the more diversified and relatively better capitalized CITY tends to exhibit higher profitability levels. Moreover, Staikouras and Wood (2004) found a significant positive relationship between bank size measures regarding the natural logarithm of total assets and profitability. Kapaya and Raphael (2016) assessed the effects of bank-specific, industry-specific, and macroeconomic determinants on banks' profitability. The study argued that bank size has a positive impact on profitability measured by net interest margin and return on assets. Mule et al. (2015) revealed that there is a positive significant relationship between firm size and profitability implying that a unit change in firm size leads to an increase in return on equity of firms. Based on this, this study develops the following hypothesis:

H₄: There is a positive relationship between bank size and bank profitability.

Capital adequacy ratio

Capital adequacy ratio (CAR) is defined as the ratio of capital to the risk-weighted sum of a bank's assets. Ben Naceur and Goaied (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. Based on this, this study develops the following hypothesis:

H₅: There is a positive relationship between capital adequacy 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 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 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 shareholders' 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), LLP (Loan loss provision as measured by the amount of total loan loss provision, Rs. in million), OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage), BS (Bank size as measured by total assets, Rs. in billion) and INF (Inflation as measured by the change in consumer price index, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.23	1.57	0.51
ROE	3.78	24.53	14.34	4.56
CAR	8.55	22.99	13.88	2.50
LLP	11.32	10232.46	2657.22	2145.81
OE	0.13	0.62	0.41	0.09
INF	4.19	9.9	6.08	2.01
BS	40.3	827.81	190.38	162.51

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 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 income to total shareholders' 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), LLP (Loan loss provision as measured by the amount of total loan loss provision, Rs. in million), OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage), BS (Bank size as measured by total assets, Rs. in billion) and INF (Inflation as measured by the change in consumer price index, in percentage).

Variables	ROA	ROE	BS	CAR	LLP	OE	INF
ROA	1						
ROE	0.551**	1					
BS	0.067	0.091	1				
CAR	0.309**	0.279**	0.421**	1			
LLP	-0.287**	-0.452**	-0.302**	-0.036	1		
OE	-0.054	0.152	-0.368**	-0.234**	0.082	1	
INF	-0.034	-0.219*	-0.001	-0.373**	-0.115	0.348**	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, inflation has a negative relationship with return on assets. It indicates that increase in inflation 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 positive relationship with return on equity. It means that increase in capital adequacy ratio leads to increase 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 positive relationship with return on equity. It shows that higher the operational efficiency ratio, higher would be the return on equity. Moreover, inflation has a negative relationship with return on equity. It indicates that increase in inflation leads to decrease in return on equity.

Regression analysis

Having indicated 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 loan loss provision, operating efficiency, capital adequacy ratio, bank size and inflation on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of loan loss provision, operating efficiency, capital adequacy ratio, bank size and inflation on return on assets

The results are based on panel data of 13 commercial banks with 104 observations for the period of 2015/16 to 2022/23 by using linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 LLP_{it} + \beta_2 OE_{it} + \beta_3 BS_{it} + \beta_4 INF_t + \beta_5 CAR_{it} + e_{it}$ 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 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 amount of total loan loss provision, Rs. in million), OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage), BS (Bank size as measured by total assets, Rs. in billion) and INF (Inflation as measured by the change in consumer price index, in percentage).

Model	Intercept	Regression coefficients of					Adj. R ²	SEE	F-value
		LLP	OE	BS	CAR	INF			
1	1.634 (10.934)**	0.057 (0.620)					0.005	0.501	0.384
2	1.973 (4.229)**		-0.084 (0.920)				0.001	0.499	0.847
3	2.297 (13.968)**			0.399 (4.727)**			0.152	0.460	22.343
4	8.518 (6.172)**				0.422 (5.054)**		0.171	0.455	25.547
5	1.497 (21.573)*					-0.086 (0.932)	0.001	0.499	0.869
6	2.251 (4.075)**	0.091 (0.942)	-0.112 (1.161)				0.002	0.500	0.867
7	3.576 (6.381)**	0.038 (0.436)	-0.221 (2.470)*	0.453 (5.211)**			0.181	0.452	9.760
8	8.058 (2.112)*	0.044 (0.505)	-0.200 (2.201)*	0.152 (0.565)	0.311 (1.188)		0.184	0.451	7.699
9	8.765 (2.249)*	0.029 (0.324)	-0.227 (2.371)*	0.144 (0.538)	0.345 (1.303)	-0.085 (0.905)	0.182	0.452	6.313
10	8.647 (2.157)*	0.030 (0.331)	-0.229 (2.348)*	0.152 (0.552)	0.337 (1.234)	-0.090 (0.888)	0.175	0.454	5.219

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 Lardic and Terraza (2019). Likewise, 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 Anggari and Dana (2020). 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 Charmler et al. (2018). Similarly, 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 Abbadi and Abu-Rub (2012). 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 Brastama and Yadnya (2020).

Estimated regression results of loan loss provision, operating efficiency, capital adequacy ratio, bank size and inflation on return on equity of Nepalese commercial banks are presented in Table 5.

Table 5

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

The results are based on panel data of 13 commercial banks with 104 observations for the period of 2015/16 to 2022/23 by using linear regression model. The model is $ROE_{it} = \beta_0 + \beta_1 LLP_{it} + \beta_2 OE_{it} + \beta_3 BS_{it} + \beta_4 INF_{it} + \beta_5 CAR_{it} + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total shareholders' 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), LLP (Loan loss provision as measured by the amount of total loan loss provision, Rs. in million), OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage), BS (Bank size as measured by total assets, Rs. in billion) and INF (Inflation as measured by the change in consumer price index, in percentage).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		LLP	OE	BS	CAR	INF			
1	3.096 (15.650)**	-0.020 (0.222)					0.008	0.663	0.049
2	3.130 (5.057)**		0.001 (0.013)				0.003	0.633	0.001
3	4.010 (18.053)**			0.350 (4.060)**			0.115	0.621	16.484
4	12.524 (6.890)**				0.429 (5.166)**		0.178	0.599	26.687
5	2.882 (33.279)**					-0.339 (3.915)**	0.107	0.624	15.324
6	2.899 (23.105)**						0.030	0.651	4.680
7	3.037 (4.127)**	-0.023 (0.236)	0.008 (0.084)				0.017	0.666	0.028
8	4.531 (5.880)**	-0.068 (0.743)	0.085 (0.915)	0.386 (4.276)**			0.114	0.622	6.115
9	21.728 (4.326)**	-0.050 (0.568)	0.025 (0.277)	0.488 (1.828)	0.903 (3.461)**		0.191	0.594	8.016
10	19.010 (3.809)**	-0.005 (0.063)	0.052 (0.556)	0.467 (1.798)	0.804 (3.134)**	-0.246 (2.715)**	0.233	0.578	8.243
11	19.051 (3.710)**	-0.006 (0.065)	0.052 (0.552)	0.469 (1.758)	0.806 (3.050)**	-0.248 (2.531)*	0.227	0.581	6.809

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 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 Wasiuzzaman and Tarmizi (2010). Likewise, beta coefficients for capital adequacy ratios are positive with return on equity. It indicates that capital adequacy ratio has a positive impact on return on equity.

This finding is consistent with the findings of Margono et al. (2020). 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 Lukorito et al. (2014). Similarly, 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 Bunyaminu et al. (2021). In addition, the beta coefficients for operational efficiency are positive with return on equity. It indicates that operational efficiency has a positive impact on return on equity. This finding is similar to the findings of Adebisi and Matthew (2015).

4. Summary and conclusion

The banking system plays an important role in the modern economic world. By facilitating the mobilization of depositor funds and directing them toward profitable ventures through lending, banks play a crucial role in the economy. Banks serve as financial mediators, effectively allocating resources to support economic growth and development. As a result, evaluating their performance is essential to preserving financial stability and fostering economic growth. Regarding bank performance, various stakeholders have different expectations and areas of interest. While depositors place a higher priority on security and dependability, regulators concentrate on safety and soundness, investors pursue profitability and shareholder value, and politicians strive for systemic stability and fair access to financial services. An essential component of the financial industry is the measurement of bank performance, which offers information about the stability, efficacy, and efficiency of bank operations. For a variety of stakeholders, including investors, regulators, policymakers, and bank management, knowing and assessing bank performance is crucial because it enables them to make well-informed decisions about risk management, investments, and regulatory compliance.

This study attempts to determine the relationship of loan loss provision, operating efficiency, capital adequacy ratio, bank size and inflation with the profitability of Nepalese commercial banks. The study is based on secondary data of 13 commercial banks with 104 observations for the period from 2015/16 to 2022/23.

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 net interest margin and profitability metrics, positively impacting ROA and ROE. Similarly, capital adequacy ratio has a positive effect on return on assets and return on equity. It means that increase in capital adequacy ratio leads to increase in return on assets and return on equity. 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. Likewise, operational efficiency has a positive relationship with return on equity. It shows that higher the operational efficiency ratio, higher would be the return on equity. The study also concluded that bank size and capital adequacy ratio play significant role in determining the profitability of Nepalese commercial banks.

References

- Abubakar, A., and I. M. Gani, 2013. Impact of banking sector development on economic growth: Another look at the evidence from Nigeria. *Journal of Business Management and Social Sciences Research* 2(4), 47-57.
- 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.

- Ahmad, F., S. H. Tahir, and B. Aziz, 2014. Impact of loan loss provision on bank profitability in Pakistan. *TLJ's Research Journal of Social Science and Management* 3(12), 34-41.
- Akter, A., and K. Mahmud, 2014. Liquidity-profitability relationship in Bangladesh banking industry. *International Journal of Empirical Finance* 2(4), 143-151.
- Al Karim, R., and T. Alam, 2013. An evaluation of financial performance of private commercial banks in Bangladesh: Ratio analysis. *Journal of Business Studies Quarterly* 5(2), 65-72.
- 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.
- Ariff, M., and C. Luc, 2008. Cost and profit efficiency of Chinese banks: A non-parametric analysis. *China Economic Review* 19(2), 260-273.
- 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.
- Batsinda, G., and J. Shukla, 2019. Inflation and profitability of commercial banks in Rwanda: A case study of bank of Kigali. *International Journal of Business and Management*, 14(10), 35-43.
- 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.
- Boateng, K., 2019. The relationship between efficiency, productivity and profitability of Ghanaian banks. *IOSR Journal of Business and Management* 21(6), 52-60.
- 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.
- 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.
- 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.
- Hooshyari, N., and A. P. Moghanloo, 2015. Evaluating the impact of inflation on profitability of banks. *Kuwait Chapter of the Arabian Journal of Business and Management Review* 4(9), 19-23.
- Ismaulina, I., and Z. Zulfadhli, 2017. Effect of capital adequacy, liquidity, and operational efficiency to profitability in Bank Syariah Mandiri (Period 2008 Sd 2015). *JURIS (Jurnal Ilmiah Syariah)* 15(1), 43-54.
- 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.
- 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.
- Kapaya, S. M., and G. Raphael (2016). Bank-specific, industry-specific and macroeconomic determinants of banks profitability: Empirical evidence from Tanzania. *International Finance and Banking*, 3(2), 100-119.

- Khatri, J., 2023. Impact of financial ratios, operational efficiency and non-performing loans on the profitability of Nepalese commercial banks. *Perspectives in Nepalese Management* 1(1), 153-166.
- 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.
- 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.
- 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.
- 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.
- Oral, M., and R. Yolalan, 1990. An empirical study on measuring operating efficiency and profitability of bank branches. *European Journal of Operational Research* 46(3), 282-294.
- Pradhan, R. S., and A. Shrestha, 2017. The impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. *Nepalese Journal of Business* 4(3), 17-32.
- 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.
- Sah, A., and R. S. Pradhan, 2023. Impact of financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese commercial banks. *Perspectives in Nepalese Management* 1(1), 3-16.
- Sapa, N., and M. Awaluddin, 2022. Effect of non-performing financing and operating expenses of operating income on profitability of Islamic Commercial Banks. *Adpebi International Journal of Multidisciplinary Sciences* 1(1), 455-463.
- Shuremo, G. A., 2016. Determinants of banks' profitability: Evidence from banking industry in Ethiopia. *International Journal of Economics, Commerce and Management* 4(2), 442-463.
- Staikouras, C. K., and G. E. Wood, 2004. The determinants of European bank profitability. *International Business and Economics Research Journal* 3(6), 57-68.
- Sufian, F., and M. S. Habibullah, 2009. Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh. *Journal of Business Economics and Management* 10(3), 207-217.
- Tan, Y., and C. Floros, 2012. Bank profitability and inflation: The case of China. *Journal of Economic Studies* 39(6), 675-696.
- 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.
- Vong, P. I., and H. S. Chan, 2009. Determinants of bank profitability in Macao. *Macau Monetary Research Bulletin* 12(6), 93-113.
- Yesmine, S., and M. S. U. Bhuiyah, 2015. Determinants of banks' financial performance: A comparative study between nationalized and local private commercial banks of Bangladesh. *International Journal of Business and Management Invention* 4(9), 33-39.

Chapter 2

Determinants of Market Stock Price Movements: A Case of Nepalese Commercial Banks

Usha Acharya*

Abstract

The study examines the determinants of market stock price movement in Nepalese commercial banks. Market price per share and change in market price per share are selected as the dependent variables. The selected independent variables are dividend per share, earnings per share, price to earnings ratio, lending rate, inflation rate and dividend yield. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2014/15 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank and the annual report of respective banks. The correlation coefficients and regression models are estimated to test the significance and importance of different factors on the market stock price movement in Nepalese commercial banks.

The study showed that earnings per share have a positive effect on market price per share and change in market price per share. It indicates that higher the earnings per share, higher would be the market price per share and change in market price per share. Likewise, price to earnings ratio has a positive effect on market price per share and change in market price per share. It indicates that higher the price to earnings ratio, higher would be the market price per share and change in market price per share. Moreover, lending rate has a negative effect on market price per share and change in market price per share. It indicates that higher the lending rate, lower would be the market price per share and change in market price per share. Furthermore, dividend yield has a negative effect on market price per share and change in market price per share. It indicates that higher the dividend yield, lower would be the market price per share and change in market price per share. In addition, inflation rate has a positive effect on market price per share and change in market price per share. It indicates that higher the inflation rate, higher would be the market price per share and change in market price per share.

Keywords: market price per share, change in market price per share, dividend per share, earnings per share, price to earnings ratio, lending rate, inflation rate, dividend yield.

1. Introduction

Stock markets are essential for economic growth as they insure the flow of resources to the most productive investment opportunities (Kurihara, 2006). Stock market is the mirror of economy. It has become an essential market which plays a vital role in economic prosperity that fostering capital formation and sustainable economic growth. Stock markets are more than a place to trade securities. They operate as a facilitator between savers and users of capital by means of pooling of funds, sharing risk, and transferring wealth. The stock price is an important factor in the investment decision of investors in the stock market, because investors mainly focus on the stock price when deciding to invest in stocks. However, stock prices fluctuate daily, which depends on several internal factors such as dividend pay-out, dividend yield, dividend per share, sales growth, leverage, earnings volatility and company size, as well as external factors such as exchange rates, inflation. and GDP. Therefore, in order to make an optimal investment decision, investors must have knowledge and awareness of the factors

* Ms. Usha is a Freelance Researcher, Kathmandu, Nepal.

that determine the stock price (Sharif *et al.*, 2015).

The share market is continuously moving and changing and it is affected not only by the success of the listed companies, but also by the dynamic business environment. Share prices are very volatile and keep on changing because of several reasons, both predictable and unpredictable. Kasman *et al.* (2011) analysed the impact of both interest rate and exchange rate on bank stock return in Turkey for the period span from 27 July 1999 to 9 April 2009 by applying OLS technique and GARCH. The findings indicated that both interest rate and exchange rate have a significant impact on bank stock return. Similarly, Narayan *et al.* (2014) investigated the impact of three economic variables, namely industrial production, interest rate and exchange rate on Indian banking stock price. The study found the presence of integration between the tested variables and bank stock prices. Ibrahim and Aziz (2003) investigated the relationship between stock prices and industrial production, money supply, consumer price index, and exchange rate in Malaysia. The study showed that stock prices have positive long-term relationships with industrial production and CPI. On contrary, the study found that stock prices have a negative association with money supply and exchange rate. Similarly, Ologunde *et al.* (2006) examined the relationship between stock market capitalization and interest rate. The study showed that the prevailing interest rate exerts positive influence on stock market capitalization. Likewise, Glezakos *et al.* (2012) examined the impact of accounting information on stock prices in Athens. The study found that the explanatory power of earnings and book value in the formulation of prices increases over times. In addition, the study showed that earnings appear to play an increasingly diminishing role in the interpretation of stock prices, compared with the book value. The study concluded that investors strive more towards fundamental parameters of businesses, than stock market data.

Wet and Mpinda (2013) examined the impact of dividend payment on shareholders' wealth while considering the short-run and long-run effects. The results of the study indicated that the dividend yield is positively related to the market price per share in both the fixed and random effect models. Menike and Prabath (2014) examined the impact of dividend per share, earnings per share, and book value per share of stock price with a sample size of 100 companies from Colombo stock Exchange (CSE) from 2008 to 2012. The study found that dividend per share, earning per share, and book value per share have positive and significant impact on stock price for the period. Arshad *et al.* (2015) examined the determinants of share prices for the listed commercial banks in Karachi stock exchange over the period 2007-2013. The study found that there is a significant positive relationship between earnings per share and stock price. Edem (2018) investigated the influence of financial ratios on stock market prices of banks in Nigeria for 7 years from 2009-2015. The study found that earnings per share has a significant positive relationship with stock prices of money deposit banks. Mondal and Imran (2010) analysed the factors determining the share price of companies listed in Dhaka Stock Exchange. The study found that dividend, market capital, price earnings ratio, earning per share, net income, return on investment, retained earnings and merger significantly affects the stock prices. Tandon and Malhotra (2013) examined the empirical relationship between share prices and company specific factors such as book value per share, dividend per share, earnings per share, price earnings ratio, dividend yield, dividend pay-out, size in terms of sale and net worth for NSE 100 companies during the period 2007-2012. The study revealed a significant positive relationship between price earnings ratio and stock price.

Humpe and Macmillan (2009) examined whether macroeconomic variables influence stock prices in US and Japan. The study suggested that long term lending rate has negative influence on stock price. Lashkary *et al.* (2013) examined the correlation between exchange rate volatility, stock price and lending behaviour of banking system in Maskan bank during 1991-2011. The study found that lending interest rate of Maskan bank negatively influence the stock price. Ibrahim and Shah (2012) examined

the interrelations between bank lending, macroeconomic conditions and financial uncertainty in the context of Malaysia. The result suggested that there is a positive relation between bank lending and stock price. Reddy (2012) examined the impact of inflation and gross domestic product on stock market returns from 1997 to 2009 using regression and correlation analysis. The study found that interest and inflation rate have negative impact on stock prices. Similarly, Nijam *et al.* (2015) investigated the relationship between the share price index of Colombo Stock Exchange. The study revealed that there is a negative correlation between stock market index and inflation measured by wholesale price index of Sri Lanka. The study also found that the stock market index significantly and positively related to gross domestic product, exchange rate and interest rate. Uddin and Chowdhury (2005) selected 137 companies which were listed on Dhaka Stock Exchange (DSE) and assessed the relationship between share price and dividend pay-out. The results implied that dividend announcement does not provide value gain for investors. The study also suggested that current dividend yield can reimburse the diminished value to some extents. The findings of the study support the irrelevancy of dividend policy.

In the context of Nepal, Amatya (2016) determined the effect of firm specific and macroeconomic variables on market price of share and firm performance of Nepalese commercial banks. The study found that there is a positive relationship between market price per share and return on assets, dividend per share, earning per share, price earnings ratio and gross domestic product. Similarly, Sapkota (2016) examined the determinants of share price of Nepalese commercial banks. The study found that earnings per share, dividend per share, price earnings ratio, return on assets and gross domestic product have significant positive impact with market price per share. Further, Pradhan and Dahal (2016) indicated that the company information, lack of profitability of the company, market operation system and government policy regarding investment are appeared to be the major causes of deficiency in the Nepalese stock market. In addition, Baral and Pradhan (2018) examined the impact of dividend policy on the share price of commercial bank in Nepal. The study found the positive relationship between earning per share, price earnings ratio, dividend per share and market price per share on top loser commercial banks of Nepal whereas negative relationship with dividend pay-out ratio in top gainer banks. Moreover, Bhattarai (2014) examined the determinants of share price of commercial banks in Nepal over the period of 2006 to 2014. The results revealed that EPS and P/E ratio have the significant positive association with share price while dividend yield has significant inverse association with share price. The study also concluded that dividend yield, earnings per share, and price earnings ratio are the most influencing factors in determining share price in Nepalese commercial banks.

Acharya and Pradhan (2019) assessed the effect of firm specific and macro-economic variable on share price determination of commercial banks in Nepal. The result showed that earnings per share, dividend per share, gross domestic product, and inflation have positive effect on market price of share. Similarly, Sapkota and Pradhan (2016) analysed the determinants of share price of Nepalese commercial banks. The study concluded that earning per share, price earnings ratio, dividend per share, leverage, return on assets and gross domestic product have positive significant impact on market price per share. Similarly, Shrestha and Subedi (2014) assessed the determinants of the stock market performance in Nepal. The study disclosed that the performance of stock market is found to respond positively to inflation and broad money growth, and negatively to interest rate.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of firm specific and macroeconomic factors on the market stock price movement. 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 factors determining stock price of Nepalese commercial banks. Specifically, it examines the relationship of dividend per share, earnings per share, price to earnings ratio, lending rate, inflation rate and dividend yield with market price per share and change in market price per share in 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 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), 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 the 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	Citizen Bank International 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 movement of market stock price of Nepalese commercial banks depends on firm specific and macro-economic determinants. The dependent variables selected for the study are market price per share and change in market price per share. Similarly, the selected independent variables in this study are dividend per share, earnings per share, price to earnings ratio, lending rate, inflation rate and dividend yield. Therefore, the models take the following forms:

$$MPS = \beta_0 + \beta_1 DPS + \beta_2 EPS + \beta_3 PE + \beta_4 LR + \beta_5 INF + \beta_6 DY + e_{it}$$

$$CMPS = \beta_0 + \beta_1 DPS + \beta_2 EPS + \beta_3 PE + \beta_4 LR + \beta_5 INF + \beta_6 DY + e_{it}$$

Where,

MPS = Market price per share as measured by the average market price per share of listed companies, in Rs.

CMPS = Change in market price as measured by the ratio of change in market price per share to previous year's market price per share, in Rs.

DPS = Dividend per share as measured by the ratio of total dividend amount to total outstanding shares, in Rs.

EPS = Earnings per share as measured by the ratio of total earnings to total outstanding shares, in Rs.

PE = Price to earnings ratio as measured by the ratio of market price per share to total earnings per share, in times.

LR = Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage.

INF = Inflation as measured by the change in consumer price index, in percentage.

DY = Dividend yield as measured by the ratio of annual dividend per share (DPS) to the current market share price, in percentage.

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

Dividend per share

Dividend per share is the amount that a company pay back to its investors in for of share or cash for each unit of share they hold. Garba (2014) examined the impact of dividend per share on stock return of the manufacturing firms listed on the Nigerian stock exchange. The study found that there is a significant negative relationship between dividend per share and stock returns. Similarly, Chhajer *et al.* (2020) investigated the factor influencing stock returns of companies having market capitalization of more than 5000 million on National stock exchange. The study found that the dividend yield has negative relationship with stock return. Srinivasan (2012) investigated the fundamental determinants of stock price in India using panel data consisting of annual time series data over the period 2006-2011. The study revealed that dividend per share has negative impact on stock price of selected companies in India. Based on it, this study develops the following hypothesis:

H_1 : There is a negative relationship between dividend per share and market stock price movement.

Earnings per share

Earnings per share is the company's profit per outstanding share of stock. Al-Tamimi *et al.* (2011) analysed the factors determining stock prices in the UAE stock market. The study found that there is positive impact of earning per share on the stock price. Similarly, Adekunle (2014) examined

the factors influencing the share price behaviour of selected firms in insurance industry in Nigeria. The study found that earnings per share and return on assets have positive relationship with share prices. The study also found that gross domestic products and inflation rate have negative relationship with share prices. Agnihotri (2017) examined the factor influencing the stock price of any company with a focus on selected cement, pharmaceutical and IT Company. The study found that earning per share, dividend per share and price earnings ratio are correlated to the future price of many companies of different sectors. The study also concluded that earnings per share is major factor influencing the stock price. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between earnings per share and market stock price movement.

Price earnings ratio

Price earnings ratio is defined as the ratio of market price per share and earning price per share. Price earnings ratio helps to determine whether the stock is overvalued or undervalued in comparison with its earning. Khan (2012) investigated the different determinants of share prices and the relationship of these determinants with the share price of Karachi Stock Exchange 100 index of Pakistan. The study found that price earnings ratio, dividend, and gross domestic product have significant positive relationship with stock price. Safitri *et al.* (2020) examine the effect of debt to equity ratio, price earnings ratio, earnings per share on stock price of banking sector companies listed in the Info Bank15 index during 2014 to 2018. The study found that price earnings ratio and earning per share are positively correlated to the stock price. Almunani (2014) investigated the quantitative factors that influence share prices for the listed banks in Amman stock exchange. The study showed that dividend per share, earnings per share, book value per share, and price earnings ratio have positive and significant impact on stock price. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between the price earnings ratio and market stock price movement.

Lending rate

Lending rate or interest rate is the amount charge by the bank for a certain period as a percentage of the amount lend. The lending rate is determined by the bank itself to lend the amount to its customers by following the NRB regulations. Andrieş *et al.* (2014) investigated the patterns of co-movement of interest rate, stock price and exchange rate in India in the period between July 1997 and December 2010 using the cross-wavelet power, the cross-wavelet coherency, and the phase difference methodologies. The cross-wavelet results show that stock price movements are lagging both to the exchange rate and interest rate fluctuations. The interest rate lead over the stock price movements is even clearer, especially after 2006, and it suggests that the stock market follows the interest rate signals. Amarasinghe (2015) examined the causal relationship between stock price and interest rate, using monthly data for the period from January 2007 to December 2013. The study found that there is negative association between interest rate and stock price. Alam and Uddin (2009) analysed the empirical relationship between stock index and interest rate for fifteen developed and developing countries: Australia, Bangladesh, Canada, Chile, Colombia, Germany, Italy, Jamaica, Japan, Malaysia, Mexico, Philippine, S. Africa, Spain, and Venezuela based on the monthly data from January 1988 to March 2003. The study suggests that there is a negative influence of interest rate on price of share. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between the lending rate and market stock price movement.

Inflation

Inflation refers to the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. Giri and Joshi (2017) analysed the long run and the short run relationship between stock price and a set of macroeconomic variables for Indian economy using annual data from 1979 to 2014. The study revealed that there is a positive influence of economic growth, inflation and exchange rate on stock prices. In addition, Mawardi *et al.* (2019) investigated the influence of macroeconomic variables on Indonesia Islamic stock that be measured by Indonesia Islamic Stock Index (ISSI) consisting of 350 Islamic stocks. The result showed that the inflation rate and industrial production index have a positive impact on stock price. Abdullahi (2020) examined the effect of unstable macroeconomic indicators on banking sector stock price behaviour in Nigeria stock exchange from 2008 to 2018. The study found that there is a positive influence of inflation rate on banking sector stock price both in short and long runs in Nigerian stock market. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between the inflation and market stock price movement.

Dividend yield

Nazir *et al.* (2010) assessed the relationship between share price volatility and dividend policy for the period of 2003 to 2008 employing fixed effect and random effect models on panel data. The study reported that share price volatility has significant negative association with dividend yield and dividend pay-out. The study also reported that size and leverage have non-significant negative effect on share price volatility. Asghar *et al.* (2011) examined the association of dividend policy with share price volatility in Pakistan for the period of 2005 to 2009. The findings showed that share price volatility has significant positive relationship with dividend yield. The study also reported that share price volatility has significant negative relationship with growth. Usman *et al.* (2021) revealed dividend per share and dividend yield have negative effect on share price. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between the dividend yield and market stock price movement.

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 per share as measured by the average market price per share of listed companies, in Rs) and CMPS (Change in market price as measured by the ratio of change in market price per share to previous year's market price per share, in Rs). The independent variables are EPS (Earnings per share as measured by the ratio of total earnings to total outstanding shares, in Rs.), DPS (Dividend per share as measured by the ratio of total dividend amount to total outstanding shares, in Rs.), PE (Price to earnings ratio as measured by the ratio of market price per share to total earnings per share, in ratio), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), DY (Dividend yield as measured by the ratio of annual dividend per share (DPS) to the current market

share price, in percentage) and INF (Inflation rate as measured by the change in consumer price index, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
MPS	173.10	3600	577.61	552.01
CMPS	-2032	1657	-59.14	431.83
DPS	0.00	105.26	16.39	13.96
EPS	5.30	78.83	26.65	12.47
PE	5.48	78.33	21.16	11.46
LR	6.80	14.42	10.37	1.90
INF	4.19	9.90	5.91	1.91
DY	0.00	9.16	3.22	2.03

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 variables of 12 Nepalese commercial banks for the study period from 2014/15 to 2022/23. The dependent variables are MPS (Market price per share as measured by the average market price per share of listed companies, in Rs) and CMPS (Change in market price as measured by the ratio of change in market price per share to previous year's market price per share, in Rs). The independent variables are EPS (Earnings per share as measured by the ratio of total earnings to total outstanding shares, in Rs.), DPS (Dividend per share as measured by the ratio of total dividend amount to total outstanding shares, in Rs.), PE (Price to earnings ratio as measured by the ratio of market price per share to total earnings per share, in ratio), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), DY (Dividend yield as measured by the ratio of annual dividend per share (DPS) to the current market share price, in percentage) and INF (Inflation rate as measured by the change in consumer price index, in percentage).

Variables	MPS	CMPS	DPS	EPS	PE	LR	INF	DY
MPS	1							
CMPS	0.202*	1						
DPS	0.703**	-0.069	1					
EPS	0.622**	0.039	0.439**	1				
PE	0.759**	0.158	0.500**	0.098	1			
LR	-0.522**	-0.066	-0.443**	-0.221*	-0.529**	1		
INF	0.354**	0.388**	0.090	0.300**	0.242*	-0.177	1	
DY	-0.199*	-0.061	0.382**	-0.158	-0.277**	0.066	-0.313**	1

Notes: 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 dividend per share and market price per share. It indicates that higher the dividend per share, higher would be the market price per share. Similarly, there is a positive relationship between earnings per share and market price per share. It indicates that higher the earnings per share, higher would be the market price per share. Likewise,

there is positive relationship between price to earnings ratio and market price per share. It indicates that higher the price to earnings ratio, higher would be the market price per share. Moreover, there is a negative relationship between lending rate and market price per share. It indicates that higher the lending rate, lower would be the market price per share. Likewise, there is a positive relationship between inflation and market price per share. It indicates that higher the inflation rate, higher would be the market price per share. Furthermore, there is a negative relationship between dividend yield and market price per share. It indicates that higher the dividend yield, lower would be the market price per share.

On the other hand, the result also shows that there is negative relationship between dividend per share and change in market price per share. It indicates that higher the dividend per share, lower would be change in market price per share. Similarly, there is a positive relationship between earnings per share and change in market price per share. It indicates that increase in earnings per share leads to increase in change in market price per share. Similarly, there is a positive relationship between price earnings ratio and change in market price per share. It indicates that increase in price earnings ratio leads to increase in change in market price per share. Moreover, there is a negative relationship between lending rate and change in market price per share. It indicates that higher the lending rate, lower would be the change in market price per share. Likewise, there is a positive relationship between inflation and change in market price per share. It indicates that higher the inflation, higher would be the change in market price per share. Furthermore, there is a negative relationship between dividend yield and change in market price per share. It indicates that higher the dividend yield, lower would be the change in 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 Table 5. More specifically, Table 4 shows the regression results of dividend per share, earnings per share, price to earnings ratio, lending rate, inflation rate and dividend yield on market price per share of Nepalese commercial banks.

Table 4

Estimated regression results of dividend per share, earnings per share, price earnings ratio, lending rate, inflation and dividend yield on market price per share of Nepalese commercial banks

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 $MPS = \beta_0 + \beta_1 DPS + \beta_2 EPS + \beta_3 PE + \beta_4 LR + \beta_5 INF + \beta_6 DY + e_i$, where the dependent variable is MPS (Market price per share as measured by the share price of the bank determined by the demand and supply forces in the market, in Rs.). The independent variables are EPS (Earnings per share as measured by the ratio of total earnings to total outstanding shares, in Rs.), DPS (Dividend per share as measured by the ratio of total dividend amount to total outstanding shares, in Rs.), PE (Price to earnings ratio as measured by the ratio of market price per share to total earnings per share, in ratio), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), DY (Dividend yield as measured by the ratio of annual dividend per share (DPS) to the current market share price, in percentage) and INF (Inflation rate as measured by the change in consumer price index, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		DPS	EPS	PE	LR	INF	DY			
1	121.655 (2.074)*	27.812 (10.191)**						0.49	394.159	103.862
2	-156.49 (1.581)		27.546 (8.184)**					0.381	434.154	66.977
3	-196.137 (2.679)*			36.574 (12.006)**				0.572	361.028	144.146
4	2147.957 (8.475)**				-151.414 (6.298)**			0.265	473.102	36.669
5	-27.196 (0.167)					102.373 (3.901)**		0.117	518.619	15.221
6	752.077 (7.645)**						-54.155 (2.094)*	0.031	543.479	4.385
7	-225.926 (2.855)*	21.074 (7.926)**	17.188 (5.773)**					0.609	345.039	84.434
8	-741.924 (14.623)**	7.712 (4.501)**	21.335 (13.740)**	29.939 (17.079)**				0.896	177.742	309.346
9	-707.254 (4.732)**	7.102 (4.369)**	21.295 (13.577)**	29.746 (15.437)**	-2.734 (0.247)			0.0895	178.55	229.93
10	-770.981 (4.989)**	7.593 (4.606)*	20.462 (12.363)**	28.993 (14.642)**	-2.109 (0.191)	14.78 (1.499)		0.897	177.478	186.622
11	-691.506 (3.896)**	9.372 (3.669)**	19.457 (9.909)**	27.434 (10.482)**	-2.051 (0.186)	13.53 (1.359)	-13.53 (0.912)	0.896	177.623	155.402
12	-617.999 (3.641)**	9.295 (3.625)**	19.993 (10.201)**	27.791 (10.629)**	-2.6 (0.235)		-15.69 (1.105)	0.896	178.359	184.583

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 dividend per share are positive with market price per share. It indicates that dividend per share has a positive impact on market price per share. This finding contradicts with the findings of Garba (2014). Similarly, the beta coefficients for earnings per share are positive with market price per share. It indicates that earnings per share have a positive impact on market price per share. This finding is consistent with the findings of Al-Tamimi *et al.* (2011). Likewise, the beta coefficients for price earnings ratio are positive with market price per share. It indicates that price earnings ratio has a positive impact on market price per share. This finding is similar to the findings of Mondal and Imran (2010). Furthermore, the beta coefficients for lending rate are negative with market price per share. It indicates that lending rate has a negative impact on market price per share. This finding contradicts with the findings of Amarasinghe (2015). Similarly, the beta coefficients for inflation are positive with market price per share. It indicates that inflation has a positive impact on market price per share. This finding is consistent with the findings of Abdullahi (2020). Similarly, the beta coefficients for dividend yield are negative with market price per share. It indicates that dividend yield has a negative impact on market price per share. This finding is similar to the findings of Asghar *et al.* (2011).

Table 5 shows the estimated regression result of dividend per share, earnings per share, price earnings ratio, lending rate, inflation and dividend yield on change in market price per share of Nepalese commercial banks.

Table 5

Estimated regression results of dividend per share, earnings per share, price earnings ratio, lending rate, inflation and dividend yield on change in market price per share of Nepalese commercial banks

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 $CMPS = \beta_0 + \beta_1 DPS + \beta_2 EPS + \beta_3 PE + \beta_4 LR + \beta_5 INF + \beta_6 DY + e_{it}$, where the dependent variable is CMPS (Change in market price per share as measured by the share price of the bank determined by the demand and supply forces in the market, in Rs). The independent variables are EPS (Earnings per share as measured by the ratio of total earnings to total outstanding shares, in Rs.), DPS (Dividend per share as measured by the ratio of total dividend amount to total outstanding shares, in Rs.), PE (Price to earnings ratio as measured by the ratio of market price per share to total earnings per share, in ratio), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), DY (Dividend yield as measured by the ratio of annual dividend per share (DPS) to the current market share price, in percentage) and INF (Inflation rate as measured by the change in consumer price index, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		DPS	EPS	PE	LR	INF	DY			
1	-24.304 (0.377)	-2.124 (0.709)						0.050	432.833	0.503
2	-95.516 (0.967)		1.365 (0.406)					0.008	433.521	0.165
3	-184.960 (2.129)			5.948 (1.645)				0.016	428.422	2.707
4	95.756 (0.413)				-14.934 (0.679)			0.005	432.918	0.461
5	-576.911 (4.594)**					87.642 (4.332)**		0.142	399.907	18.672
6	-17.410 (0.222)						-12.951 (0.628)	0.006	433.052	0.395
7	-84.661 (0.851)	-3.294 (0.986)	2.985 (0.798)					0.008	433.577	0.569
8	-264.488 (2.190)*	-8.139 (2.146)*	4.430 (1.198)	10.434 (2.550)*				0.040	423.126	2.482
9	-231.033 (0.649)	-8.207 (2.120)*	4.391 (1.176)	10.248 (2.233)*	-2.638 (0.100)			0.031	425.154	1.846
10	-589.916 (1.691)	-5.441 (1.462)	-0.299 (0.080)	6.007 (1.344)	0.883 (0.035)	83.232 (3.741)**		0.139	400.638	4.462
11	-1197.178 (3.126)*	-19.033 (3.453)**	7.416 (1.725)	17.923 (3.174)*	0.438 (0.018)	92.777 (4.317)**	99.515 (3.231)*	0.256	383.300	5.801
12	-693.145 (1.754)	-19.561 (3.278)**	11.128 (2.440)*	20.372 (3.348)**	-3.332 (0.129)		81.234 (2.458)*	0.076	415.113	2.758

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.
- Change in market price per share is the dependent variable.

Table 5 shows that the beta coefficients for dividend per share are negative with change in market price per share. It indicates that dividend per share has a positive impact on change in market price per share. This finding is similar to the findings of Srinivasan (2012). Similarly, the beta coefficients for earnings per share are positive with change in market price per share. It indicates that earnings per share have a positive impact on change in market price per share. This finding is consistent with the findings of Arshad *et al.* (2015). Likewise, the beta coefficients for price earnings ratio are positive with change in market price per share. It indicates that price earnings ratio has a positive impact on change in market price per share. This finding is similar to the findings of Khan (2012). Furthermore, the beta coefficients for lending rate are negative with change in market price per share. It indicates that lending rate has a negative impact on change in market price per share. This finding contradicts with the findings of Alam and Uddin (2009). Likewise, the beta coefficients for inflation are positive with change in market price per share. It indicates that inflation has a positive impact on change in market price per share. This finding is consistent with the findings of Mawardi *et al.* (2019). Similarly, the beta coefficients for dividend yield are negative with change in market price per share. It indicates that dividend yield has a negative impact on change in market price per share. This finding is consistent with the findings of Usman *et al.* (2021).

4. Summary and conclusion

The stock market stimulates economic activities by ensuring that reserves flow towards the most productive investments. Efficient allocation of resources results in better utilization of capital, fostering economic activities across various sectors. Overall, the stock market not only helps in mobilizing savings for investment in productive channels but also ensures efficient allocation of capital, thereby boosting economic growth and development.

This study attempts to analyse the factors determining stock price 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 dividend per share have positive impact on market price per share and negative impact on change in market price per share. Similarly, earnings per share has a positive impact on market price per share and change in market price per share. Similarly, price earnings ratio has a positive impact on market price per share and change in market price per share. The study showed that earnings per share, price earnings ratio, dividend per share, and inflation have positive impact on market stock price movement. However, lending rate and dividend yield has negative impact on market stock price movement. The study concluded that inflation followed by price earnings ratio, dividend per share and earnings per share is the most influencing factor that explain 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.

References

- Abdullahi, I. B., 2020. Effect of unstable macroeconomic indicators on banking sector stock price behaviour in Nigerian Stock Market. *International Journal of Economics and Financial Issues* 10(2), 1-5.
- Acharya, N., and S. Pradhan, 2019. Relationship between trading volume, stock return and return volatility: A case of Nepalese insurance companies. *Nepalese Journal of Insurance and Social Security* 2(2), 32-41.
- Adekunle, S. A., and E. M. Aghedo, 2014. Corporate governance and financial performance of selected quoted companies in Nigeria. *European Journal of Business and Management* 6(9), 53-60.
- Agnihotri, A., 2017. Study of factors influencing the stock prices of selected IT, cement, and pharmaceutical companies in India. *Global Journal of Enterprises Information System* 9(2), 16-22.
- Alam, M. D., 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.
- Almumani, D. M., 2014. Determinants of equity share prices of the listed banks in Amman stock exchange: Quantitative approach. *International Journal of Business and Social Science* 5(1), 91-104.
- Al-Tamimi, H. A., H. Alwan, and A. A. Abdel Rahman, 2011. Factors affecting stock prices in the UAE financial markets. *Journal of Transnational Management* 16(1), 1-19.
- Amarasinghe, A. A., 2015. Dynamic relationship between interest rate and stock price: Empirical evidence from Colombo stock exchange. *International Journal of Business and Social Science* 6(4), 92-97.
- 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.
- Andrieş, A. M., I. Ihnatov, and A. K. Tiwari, 2014. Analyzing time–frequency relationship between interest rate, stock price and exchange rate through continuous wavelet. *Economic Modelling* 41(1), 227-238.

- Arshad, Z. R., A. Ali, S. Yousaf, and S. Jamil, 2015. Determinants of share prices of listed commercial banks in Pakistan. *IOSR Journal of Economics and Finance* 6(2), 56-64.
- Asghar, M., S. Z. A. Shah, K. Hamid, and M. T. Suleman, 2011. Impact of dividend policy on stock price risk: Empirical evidence from equity market of Pakistan. *Far East Journal of Psychology and Business* 4(1), 45-52.
- Baral, R. K., and A. Pradhan, 2018. Impact of dividend policy on share price of commercial bank in Nepal. *International Research Journal of Management Science* 3(1), 107-122.
- Bhattarai, Y. R., 2014. Determinants of share price of Nepalese commercial banks. *Economic Journal of Development Issues* 18(1-2), 1-12.
- Chhajaj, P., V. Mehta, and V. Gandhi, 2020. Factors influencing stock returns: evidence from national stock exchange, India. *International Journal of Management* 11(5), 631-643.
- Edem, I. N., 2018. The inter-play between financial ratios and stock market prices of deposit money banks in Nigeria. *International Accounting and Taxation Review* 2(2), 117-130.
- Garba, A., 2014. Impact of dividend-per-share on common stock returns: A case study of some selected manufacturing firms listed on Nigeria stock exchange. *European Journal of Business and Management* 6(30), 36-43.
- Giri, A. K., and P. Joshi, 2017. The impact of macroeconomic indicators on Indian stock prices: an empirical analysis. *Studies in Business and Economics* 12(1), 61- 78.
- Glezakos, M., J. Mylonakis, and C. Kafourous, 2012. The impact of accounting information on stock prices: Evidence from the Athens Stock Exchange. *International Journal of Economics and Finance* 4(2), 56-68.
- Humpe, A., and P. Macmillan, 2009. Can macroeconomic variables explain long term stock market movements? A comparison of the US and Japan. *Applied Financial Economics* 19(2), 111-119.
- Ibrahim, M. H., and H. Aziz, 2003. Macroeconomic variables and the Malaysian equity market: A view through rolling sub-samples. *Journal of Economic Studies* 30(1), 6-27.
- Ibrahim, M. H., and M. E. Shah, 2012. Bank lending, macroeconomic conditions and financial uncertainty: Evidence from Malaysia. *Review of Development Finance* 2(3-4), 156-164.
- Kasman, S., G. Vardar, and G. Tuna, 2011. The impact of interest rate and exchange rate volatility on banks stock returns and volatility: Evidence from Turkey. *Economic Modeling* 28(3), 1-32.
- Khan, M. N., 2012. Determinants of share prices at Karachi stock exchange. *International Journal of Business and Management Studies* 4(1), 111-120.
- Kurihara, Y., 2006, The relationship between exchange rate and stock prices during the quantitative easing policy in Japan, *International Journal of Business* 11(4), 375-386.
- Lashkary, M., S. B. Imandoust, A. Goli, and N. Hasannia, 2013. The study of correlation between exchange rate volatility, stock price and lending behavior of banking system (Case Study Maskan Bank). *International Journal of Engineering Research and Applications* 3(2), 912-920.
- Mawardi, I., T. Widiastuti, and P. S. Sukmaningrum, 2019. The impact of macroeconomic on Islamic stock prices: Evidence from Indonesia. *KnE Social Sciences* 2(1), 499-509.
- Menike, M. G., and U. S. Prabath, 2014. The impact of accounting variables on stock price: evidence from the Colombo Stock Exchange, Sri Lanka. *International Journal of Business and Management* 9(5), 125-137.
- Mondal, S. A., and M. S. Imran, 2010. Determinants of stock price: A case study on Dhaka Exchange exchange. *International Journal of Finance* 2(3), 1-16.
- Narayan, P. K., S. Narayan, and H. Singh, 2014. The determinants of stock prices: new evidence from the Indian

- banking sector. *Emerging Markets Finance and Trade* 50(2), 5-15.
- Nazir, M. S., M. M. Nawaz, W. Anwar, and F. Ahmed, 2010. Determinants of stock price volatility in Karachi stock exchange: The mediating role of corporate dividend policy. *International Research Journal of Finance and Economics* 55(55), 100-107.
- Nijam, H. M., S. M. M. Ismail, and A. M. M. Musthafa, 2015. The impact of macro-economic variables on stock market performance; Evidence from Sri Lanka. *Journal of Emerging Trends in Economics and Management Sciences* 6(2), 151-157.
- Ologunde, A.O., D. O. Elumilade, and T. O. Asaolu, 2006. Stock market capitalization and interest rate in Nigeria: A time series analysis. *International Research Journal of Finance and Economics* 13(2), 36-47.
- Pradhan, R. S., and S. Dahal, 2016. Factors affecting the share price: Evidence from Nepalese commercial banks. *Nepalese Journal of Finance* 3(2), 1-16.
- Reddy, D. L., 2012. Impact of inflation and GDP on stock market returns in India. *International Journal of Advanced Research in Management and Social Sciences* 1(6), 120-136.
- Safitri, K., I. M. Mertha, N. G. P. Wirawati, and A. Dewi, 2020. The impact of debt to-equity ratio, price earnings ratio, earning per share to the stock price on banking sectors listed in infobank15 index 2014. *American Journal of Humanities and Social Science Research* 4(5), 49-56.
- Sapkota, A. K., and R. S. Pradhan, 2016. Firm specific and macroeconomic determinants of share prices of Nepalese Commercial Banks. *Journal Management and Development Economics* 5(1), 1-16.
- 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.
- Shrestha, P. K., and B. R. Subedi, 2014. Determinants of stock market performance in Nepal. *NRB Economic Review* 26(2), 25-40.
- Srinivasan, P., 2012. Determinants of equity share prices in India: A panel data approach. *The Romanian Economic Journal* 46(6), 205-228.
- 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), 85-95.
- Uddin, M. H., and G. M. Chowdhury, 2005. Effect of dividend announcement on shareholders' value: Evidence from Dhaka Stock Exchange. *Journal of Business Research* 7(1), 61-72.
- Usman, B., H. S. Lestari, and S. Sofyan, 2021. The effect of dividend policy on share price manufacturing companies in Indonesia. *Accounting, Management and Economics* 12(1), 117-122.
- Wet, D. J., and M. Mpinda, 2013 The impact of dividend payments on shareholders' wealth: Evidence from the vector error correction model. *International Business and Economics Research Journal* 12(11), 1451-1465.

Chapter 3

Effect of Capital Adequacy Ratio, Third Party Funds, Loan to Deposit Ratio and Bank Size on the Profitability of Nepalese Commercial Banks

Mahalaxmi Chaudhary*

Abstract

This study examines the effect of capital adequacy ratio, third party funds, loan to deposit ratio and bank 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 capital adequacy ratio, third party funds, loan to deposit ratio bank size, number of branches and loan to asset 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 Banking and Financial Statistics published by Nepal Rastra Bank, the annual report of respective banks and audited financial statement of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of capital adequacy, third party funds, loan to deposit ratio bank size, number of branches and loan to asset ratio on the profitability of Nepalese commercial banks.

The study showed that 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. In contrast, third party funds have a negative effect on return on assets and return on equity. It means that increase in third party funds leads to decrease in return on assets and return on equity. Likewise, loan to deposit ratio has a negative effect on return on assets and return on equity. It shows that higher the loan to asset ratio, lower would be the return on assets and return on equity. Similarly, loan to asset ratio has a negative effect on return on assets and return on equity. It means that increase in loan to asset ratio leads to decrease in the return on assets and return on equity.

Keywords: bank performance, capital adequacy ratio, third party funds, loan to deposit ratio, bank size, number of branches and loan to asset ratio

1. Introduction

Banks are liaison institutions that collect funds from public surplus for the lending purpose to the entire fraternity of business and trade. The stability of the banking system is a prerequisite for an effective financial system and achieving economic growth. In particular, 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. A strong financial system plays a critical role in enabling growth and reducing vulnerability to crises among commercial banks. One of the primary reasons individuals deposit their money in banks is to secure a guaranteed rate of return, while banks aim to achieve the lowest possible cost of capital. The investors also incline to avert various types of financial and market risks. Thus, the emerging issue for every bank is risk mitigation and adoption of fine risk management practices in present chaotic and volatile scenarios (Al-Rdaydeh et al., 2017). The banking system plays an important role in the modern economic world. Bank is an institution or company whose activities are to collect funds in the form of demand deposits, savings deposits and other deposits from parties who have excess funds (surplus spending units) and then place them back to people who need funds (deficit spending units) through the sale of financial services which in turn can improve the welfare of the people at large (Damayanti and Savitri, 2018). The banks

* Ms. Chaudhary is a Freelance Researcher, Kathmandu, Nepal.

play a crucial role in the creation of new capital (or capital formation) in a country and thus help the growth process. The banking industry has a significant role in creating equity and supporting economic growth. Capital adequacy ratio (CAR) is a crucial indicator of a bank's financial health and a key pillar of a stable financial system. It acts like a safety net, ensuring that banks have enough capital to absorb potential losses and remain operational even during challenging economic times (Dadhich et al., 2020). Broadly, the capital adequacy ratio can help ensure the efficiency and stability of a nation's financial system by lowering the risk of banks collapsing. A bank with a high capital adequacy ratio is considered safe and likely to meet its financial commitments. A higher CAR incentivizes banks to adopt more cautious lending practices. Knowing they have limited capital to absorb losses, banks are more likely to thoroughly assess borrowers' creditworthiness and avoid excessive risk-taking in their lending activities.

Anggari et al. (2020) analyzed the effect of capital adequacy ratio, third party funds, loan to deposit ratio, bank size on the profitability in banking companies on IDX. The results of this study revealed that the capital adequacy ratio, third party fund, bank size had a positive impact on profitability. Meanwhile, loan to deposit ratio has a positive and insignificant effect on the profitability of banking companies in the Indonesia stock exchange during the 2016–2018 periods. Shabri and Azhari (2021) assessed the third-party funds (DPK), capital adequacy ratio (CAR) and non performing financing (NPF) as determinants that affect return on asset (ROA) at BPRS in West Sumatra Province through the intervening variable financing to deposit ratio (FDR) for the 2015–2020 period. The results showed that DPK, CAR and FDR had no direct effect on the ROA of BPRS in West Sumatra Province for the 2015–2020 period, only NPF had a direct effect on ROA. While indirectly through intervening variables, DPK and NPF have no effect on ROA, only CAR can be mediated by FDR on ROA. Barnor and Odonkor (2012) investigated capital adequacy and the performance of Ghanaian banks. From the results, the study indicated a negative impact of capital adequacy ratio on bank performance (Return on Assets (ROA)). Moreover, the results also showed negative impact of capital adequacy ratio (CAR) on the performance (Return on equity). Al-Chahadah et al. (2022) examined the relationship between liquidity risk and the profitability among commercial banks listed on the Amman Stock Exchange. The results showed no statistically significant relationship between the liquidity risk indicators and the majority of profitability indicators. However, the cash reserve ratio (CRR) index was statistically significant with the utilization ratio (UR). Additionally, there was a statistically significant relationship between the return on equity and the legal reserve ratios and the funds' investment.

Berniz et al. (2023) examined the Islamic commercial banks experienced liquidity excess due to the third-party funds that increased and the weak distribution of financing by Islamic banks during the COVID-19 pandemic. The results of this study showed that third party funds, asset quality (Non performing financing), and capital adequacy ratio have a significant effect on the liquidity of Islamic banks, while profit and loss sharing and return on assets do not affect the liquidity of Islamic banks. Witjaksono and Natakusumah (2020) examined the capital adequacy and the comparison of operating expenses to operating income effect on profitability. The results showed that capital adequacy and the comparison of operating expenses to operating income has a significant effect on profitability. Meanwhile, third party funds and non-performing loans have no effect on profitability. The results showed that Islamic banking requires additional capital while increasing the efficiency of its operational activities. Hapsari (2018) examined moderating role of size in the effect of loan to deposit ratio and non-performing loan toward banking financial performance. The result showed that loan to deposit ratio has a positive impact toward financial performance. Similarly, non-performing loan has negative impact on financial performance, while size was not moderating both the effect of loan to deposit and non-performing loan toward financial performance. Velnampy and Nimalathasan (2010) analyzed the relationship between firm size and profitability in Bank of Ceylon. The study showed that there is a

positive relationship between firm size and profitability in commercial bank of Ceylon Ltd, but there is no relationship between firm size and profitability in Bank of Ceylon.

Kumar et al. (2020) investigated the relationship between monetary policy and bank profitability in New Zealand. The study revealed that capital adequacy ratio is positively related to return on assets. A high capital adequacy ratio can enable the bank increase its scope of profitable investments. On the other hand, a bank with a low capital adequacy ratio will most likely have a narrow scope of profitable investments. Almaqtari et al. (2019) examined the determinants of profitability of Indian commercial banks. The results revealed that bank size, the number of branches, assets management ratio, operational efficiency, and leverage ratio are the most important bank-specific determinants that affect the profitability of Indian commercial banks as measured by ROA. 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.

In the context of Nepal, Poudel (2018) assessed the impact of credit risk on profitability of commercial banks in Nepal. The results confirmed that credit risk has a significant negative impact on profitability of commercial banks in Nepal. In addition, solvency ratio, interest spread rate, and inflation have the negative impact on ROE as profitability. In contrast, capital adequacy ratio, total assets, and GDP growth have positive impact on profitability of commercial banks in Nepal. Finally, inter-bank interest rate has positive impact on profitability. Neupane (2020) examined the key determinants of profitability of Nepalese commercial banks. The analysis reveals that the bank profitability measured by ROA of Nepalese commercial banks is significantly affected by concentration ratio, banking sector development, GDP growth, inflation and exchange rate. However, it is not significantly affected by the internal factors like bank size, capital base, deposit, loan, off-balance sheet activities and number of branches. Likewise, Darlami (2023) 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 concerning the effect of capital adequacy ratio, third party funds, loan to deposit ratio and bank size on bank 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 main purpose of the study is to analyze the effect of capital adequacy ratio, third party funds, loan to deposit ratio and bank size on profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, third party funds, loan to deposit ratio and bank size, number of branches and loan to asset ratio on return on assets and return on equity 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 gathered from 11 Nepalese commercial banks from 2012/13 to 2022/23, leading to a total of 121 observations. The study has employed convenience sampling method. The main sources of data include Banking and Financial Statistics

published by Nepal Rastra Bank, the annual report of respective banks 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 commercial banks	Study period	Observations
1	Agricultural Development Bank Limited	2012/13 - 2022/23	11
2	Citizens Bank International 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	Standard Chartered Bank Nepal Limited	2012/13 - 2022/23	11
10	Sanima Bank Limited	2012/13 - 2022/23	11
11	Siddharth Bank 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 bank performance depends on various financial ratios and indicators. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables in this study are capital adequacy ratio, third party funds, loan to deposit ratio, bank size, number of branches and loan to asset ratio. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 TPF_{it} + \beta_3 LTD_{it} + \beta_4 BS_{it} + \beta_5 NOB_{it} + \beta_6 LAR_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 TPF_{it} + \beta_3 LTD_{it} + \beta_4 BS_{it} + \beta_5 NOB_{it} + \beta_6 LAR_{it} + e_{it}$$

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 shareholders' equity, in percentage.

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

TPF = Third party funds as measured by the total of savings, fixed deposit and current deposit, Rs.in billion.

LTD = Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percentage.

BS = Bank size as measured by the total assets, Rs. in billion.

NOB = Number of branches as measured by total number of bank branches, in numbers.

LAR= Loan to asset ratio as measured by the ratio of total loan to total assets, in percentage.

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

Capital adequacy ratio

Capital adequacy ratio stands as a pivotal measure of a bank's financial robustness and resilience. CAR is computed by dividing a bank's regulatory capital comprising Tier 1 and Tier 2 capital by its risk-weighted assets. A higher CAR percentage signifies a more substantial financial cushion, indicating the bank's ability to absorb losses and navigate economic uncertainties effectively. Conversely, a lower CAR suggests a potential vulnerability to financial stress. Hersugondo et al. (2021) found that capital adequacy ratio has negative impact on both ROA and ROE as bank profitability. Similarly, Margono et al. (2020) showed that capital adequacy has a positive impact on bank performance. Furthermore, Chou and Buchdadi (2016) indicated that the impact of capital adequacy ratio on return on asset is positive. Likewise, Anggari and Dana (2020) capital adequacy ratio has a positive and insignificant effect on the profitability of banking companies in the Indonesia stock exchange during the 2016–2018 periods. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between total capital adequacy ratio and profitability.

Third party funds

Third party funds are the most important funds in bank activities which are calculated by total of current account, savings and deposit. It comes from the public that deposits their funds to the banks with deposit agreements of demand deposits, savings, and deposits. Sukmadewi (2020) explains that third-party funds are one of the largest sources of funds obtained from the public. The increase in third-party funds will also result in large credit growth so that bank profitability will increase. Magdalena et al. (2019) also revealed that the capital adequacy ratio, loans received, and third-party funds have a significant influence to banks profitability on commercial bank. Anggari and Dana (2020) found a positive effect of capital adequacy ratio, third party fund, bank size on profitability. Moreover, Fitri and Sisdianto (2020) showed that inflation and third-party fund have a significant effect on profitability. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between third party funds loan and profitability.

Loan to deposit ratio

Loan to deposit ratio (LDR) serves as a key indicator of a bank's lending activities relative to its deposit base. A higher LDR signifies a more aggressive lending strategy, showcasing the institution's utilization of a significant portion of its deposits for lending purposes. Hapsari (2018) showed that loan to deposit ratio had a positive impact toward financial performance. Moreover, Liyana and Indrayani (2020) found that loan to deposit ratio has positive impact on return on assets. Likewise, Hadian (2021) stated that LDR had positive impact on return on assets. Similarly, Yuhasril (2019) stated that loan to deposit ratio simultaneously has positive impact on return on assets. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between loan to deposit ratio and profitability.

Bank size

Bank size is the assets of the banks as measured by the total assets. Parvin et al. (2014) revealed that the loan to asset ratio and bank size have a positive relation with return on asset. Ali (2018) examined the impact of firm size on profitability using comparative study of Islamic Bank

and commercial Bank in Pakistan. The study found that large companies in general have large total assets and are able to generate large profits as well. The bigger the size, the greater the profitability of the bank. Terraza (2015) showed that company size has a significant positive effect on profitability. Pavkovic et al. (2018) showed that bank size has a positive and significant effect on profitability of the Croatian banking sector. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between bank size and profitability.

Number of branches

Le and Ngo (2020) found a positive relationship between the number of branches and the bank's profitability (ROA and ROE). Shihadeh and Liu (2019) found a positive effect of financial inclusion on profitability, the former being measured by the number of branches. Tsolas (2010) revealed that there is Strongly positive link between branch number and long-term profitability. Muhindi and Ngaba (2018) showed that the banks that have many branches, huge customer deposits, huge capital base and large loan book have positive and high ROA. Almaqtari et al. (2019) found that bank size, the number of branches, assets management ratio, operational efficiency, and leverage ratio have positive effect on the profitability of Indian commercial banks as measured by ROA. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between number of branches and profitability.

Loan to asset ratio

Sufian and Habibullah (2009) examined the determinants of bank profitability in a developing economy in context of Philippines. The study found that loan to assets ratio has a positive impact on profitability. Likewise, Ali and Puah (2018) assessed the bank size and funding risk effect on banks' stability in case of Pakistan. The study also found that there exists positive relationship between loan to assets ratio and banks stability. In addition, Zaman *et al.* (2011) examined the determinants of bank profitability in Pakistan using internal factor analysis. The study concluded that total loan to total asset ratio has positive relationship with ROA. Similarly, Saeed (2014) investigated bank-related, industry-related and macroeconomic factors affecting bank profitability in context of United Kingdom. The study revealed a positive impact of loan to assets ratio on ROA as well as ROE. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between loan to asset ratio and profitability.

2. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the 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 shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), TPF (Third party funds as measured by the total of savings, fixed deposit and current deposit, Rs.in billion), LTD (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), BS (Bank size as measured by the total assets, Rs.in billion), NOB (Number of branches as measured by total number of bank branches, in numbers), and LAR (Loan to Asset ratio as measured by the ratio of total loans to total assets, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.50	3.22	1.62	0.53
ROE	6.26	102.96	17.18	11.25
CAR	(0.49)	23.31	13.91	3.18
TPF	17.79	321.65	112.71	67.48
LTD	48.92	107.01	80.60	11.21
BS	21.98	394.88	139.80	84.40
NOB	12.00	360.00	127.48	89.82
LAR	42.45	86.17	66.25	8.23

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 shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), TPF (Third party funds as measured by adding saving, fixed deposits and current deposits, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), BS (bank size is measured by total Assets, in Billion), NOB (number of branches as measured by total number of bank branches), and LAR (Loan to asset ratio as measured by total loan to total assets).

Variables	ROA	ROE	CAR	TPF	LTD	BS	NOB	LAR
ROA	1							
ROE	0.190*	1						
CAR	0.326**	-0.479**	1					
TPF	-0.348**	-0.180*	0.023	1				
LTD	-0.147	-0.450**	0.279**	0.133	1			
BS	-0.354**	-0.219*	0.066	0.992**	0.185*	1		
NOB	-0.164	-0.111	0.034	0.789**	0.325**	0.791**	1	
LAR	-0.150	-0.052	-0.013	0.105	0.764**	0.115	0.280**	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 means that increase in capital adequacy ratio leads to increase in return on assets. In contrast, there is a negative relationship between third party funds and return on assets. It means that increase in third party funds leads to decrease in return on assets. Likewise, loan to deposit ratio has a negative relationship with return on assets. It shows that higher the loan to asset ratio, lower would be the return on assets. Similarly, there is a negative relationship between bank size and return on assets. It indicates that increase in bank size leads to decrease in return on assets. In addition, number of bank branches has a negative relationship with return on assets. It indicates that increase in number of bank branches leads to decrease in return on assets. Similarly, there is a negative relationship between loan to asset ratio and return on assets. It means that increase in loan to asset ratio leads to decrease in the return on assets.

Likewise, the result also shows that 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.

Similarly, there is a negative relationship between third party funds and return on equity. It means that increase in third party funds leads to decrease in return on equity. Likewise, loan to deposit ratio has a negative relationship with return on equity. It shows that higher the loan to deposit ratio, lower would be the return on equity. Similarly, there is a negative relationship between bank size and return on equity. It indicates that increase in bank size leads to decrease in return on equity. In addition, number of branches has a negative relationship with return on equity. It indicates that increase in number of branches leads to decrease in return on equity. Similarly, there is a negative relationship between loan to asset ratio and return on equity. It means that increase in loan to asset 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 the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, loan to deposit ratio and loan loss provision on bank performance of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, third party funds, loan to deposit ratio, bank size, number of branches and loan to asset ratio on return on assets of Nepalese commercial banks

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 $ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 TPF_{it} + \beta_3 LTD_{it} + \beta_4 BS_{it} + \beta_5 NOB_{it} + \beta_6 LAR_{it} + e_{it}$ where, the dependent variables are 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 bank capital to total risk weighted assets, in percentage), TPF (Third party funds as measured by adding saving, fixed deposits and current deposits, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), BS (bank size is measured by total Assets, in Billion), NOB (number of branches as measured by total number of bank branches), and LAR (Loan to asset ratio as measured by total loan to total assets).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		CAR	TPF	LTD	BS	NOB	LAR			
1	0.862 (4.173)**	0.054 (3.761)**						0.099	0.505	14.149
2	1.928 (21.695)**		-0.003 (4.046)**					0.114	0.501	16.371
3	2.180 (6.229)**			-0.007 (1.618)				0.013	0.528	2.619
4	1.931 (21.919)**				-0.002 (4.131)**			0.118	0.499	17.068
5	1.742 (20.905)**					-0.001 (1.812)		0.019	0.527	3.283
6	2.261 (5.787)**						-0.010 (1.657)	0.014	0.528	2.745
7	1.158 (5.689)**	0.056 (4.144)**	-0.003 (4.408)**					0.220	0.470	17.885
8	1.811 (5.613)**	0.066 (4.790)**	-0.003 (4.132)**	-0.010 (2.570)**				0.255	0.459	14.691
9	1.528 (4.245)**	0.072 (5.108)**	0.007 (1.230)	-0.008 (1.814)	-0.008 (1.718)			0.267	0.455	11.940
10	1.873 (5.237)**	0.075 (5.586)**	0.003 (0.620)	-0.013 (3.024)**	-0.007 (1.666)	0.003 (3.488)**		0.332	0.435	12.905
11	1.796 (4.521)**	0.077 (5.449)**	0.002 (0.448)	-0.015 (2.181)*	-0.006 (1.425)	0.003 (3.452)**	0.004 (0.452)	0.327	0.436	10.713

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 Chou and Buchdadi (2016). In contrast, beta coefficients for third party funds are negative with return on assets. It indicates that a third party fund has negative impact on return on assets. This finding is similar to the findings of Salman (2021). 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 Sari and Septiano (2020). Similarly, the beta coefficients for bank size are negative with return on assets. It indicates that bank size has a negative impact on return on assets. This finding is similar to the findings of Abeyrathna and Priyadarshana (2019). Similarly, the beta coefficients for number of branches are negative with return on assets. It indicates that number of branches has a negative impact on return on assets. This finding contradicts with the findings of Al-Eitan et al (2022). In addition, the beta coefficients for loan to asset ratio are negative with return on assets. It indicates that loan to asset ratio has a positive impact on return on assets. This finding is inconsistent with the findings of Pradhan and Khadka (2017).

Table 5 shows the regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, loan to deposit ratio and loan loss provision on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, loan to deposit ratio and loan loss provision on return on assets of Nepalese commercial banks

The results are based on panel data of 11 commercial banks with 209 observations for the period of 2012/13 to 2022/23 by using linear regression model. The model is $ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 TPF_{it} + \beta_3 LTD_{it} + \beta_4 BS_{it} + \beta_5 NOB_{it} + \beta_6 LAR_{it} + e_{it}$ where, the dependent variables are ROE (Return on equity as measured by the ratio of net income to total shareholders' equity, in percentage.). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), TPF (Third party funds as measured by adding saving, fixed deposits and current deposits, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), BS (bank size is measured by total Assets, in Billion), NOB (number of branches as measured by total number of bank branches), and LAR (Loan to asset ratio as measured by total loan to total assets).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		CAR	TPF	LTD	BS	NOB	LAR			
1	40.739 (10.040)**	-1.694 (5.955)**						0.223	9.919	35.457
2	20.567 (10.424)**		-0.030 (1.998)*					0.024	11.115	3.992
3	53.624 (8.020)**			-0.452 (5.503)**				0.196	10.089	30.280
4	21.269 (10.934)**				-0.029 (2.452)**			0.040	11.025	6.014
5	18.948 (10.660)**					-0.014 (1.215)		0.004	11.231	1.476
6	21.918 (2.624)**						-0.072 (0.571)	0.006	11.285	0.326
7	43.722 (10.320)**	-1.680 (5.991)**	-0.028 (2.132)*					0.246	9.774	20.528
8	64.871 (10.076)**	-1.362 (4.976)**	-0.021 (1.703)	-0.327 (4.172)**				0.338	9.158	21.391
9	62.118 (8.566)**	-1.302 (4.594)**	0.069 (0.629)	-0.302 (3.602)**	-0.073 (0.829)			0.336	9.171	16.172
10	67.416 (9.153)**	-1.250 (4.507)**	0.017 (0.152)	-0.384 (4.377)**	-0.065 (0.751)	0.041 (2.600)**		0.367	8.951	14.931
11	51.441 (6.945)**	-0.856 (3.244)**	-0.146 (1.401)	-0.913 (6.921)**	0.070 (0.842)	0.038 (2.632)**	0.800 (5.032)**	0.478	8.133	19.293

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. Return on equity (ROE) is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are negative with return on equity. It indicates that capital adequacy has a negative impact on return on equity. This finding is consistent with the findings of Antwi (2019). Likewise, beta coefficients for third party funds are negative with return on equity. It indicates that third party funds have a negative impact on return on equity. This finding is similar to the findings of Shabri and Azhari (2021). Similarly, 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 inconsistent with the findings of Kwoon et al. (2022). Likewise, the beta coefficients for bank size are negative with return on equity. It indicates that bank size has a negative impact on return on equity. This finding is inconsistent with the findings of Tran and Phan (2020). Moreover, the beta coefficients for number of branches are negative with return on equity. It indicates that number of branches has a negative impact on return on equity. This finding is consistent with the findings Wadhe (2015). In addition, the beta coefficients for loan to asset ratio are negative with return on equity. It indicates that loan to asset ratio has negative impact on return on equity. This finding is similar to the findings of Bhattra (2018).

4. Summary and conclusion

The stability of the banking industry becomes essential to the growth of the economy as a whole. Because they dominate the financial sector and make significant contributions to the nation's economic growth, banks are the most essential component of any nation's financial system. The outcome of an evaluation of a bank's state based on its performance and risks is the bank's soundness. Additionally, banks are extremely important for creating jobs, improving financial resources, and contributing to the general development of a nation. It aids in the expansion of investment and industrial activity.

This study attempts to analyze the effect of capital adequacy ratio, third party funds, loan to deposit ratio and bank size on the profitability of Nepalese commercial banks. 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 major conclusion of the study is that third party funds, loan to deposit ratio, bank size, number of branches and loan to deposit ratio have negative impact on return on assets and return on equity of Nepalese commercial banks. However, capital adequacy ratio has positive impact on return on assets but negative impact on return on equity. The study also concluded that capital adequacy ratio followed by loan to deposit ratio is the most influencing factor that explains the changes in the return on assets of Nepalese commercial banks. Similarly, the study also concluded that loan to asset ratio and loan to deposit ratio have the most significant impact on return on equity in banks, as they closely relate to how effectively a bank utilizes its assets and deposits to generate income of Nepalese commercial banks.

References

- Al-Chahadah, A. R., G. Refae, and A. Qasim, 2022. The relationship between liquidity risk and profitability in the commercial banks listed in Amman Stock Exchange. *AAU Journal of Business and Law* 6(1), 1-16.
- Ali, M., and C. H. Puah, 2018. Does bank size and funding risk effect banks' stability? A lesson from Pakistan. *Global Business Review* 19(5), 1166-1186.
- Ali, S. A., 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), 31-35.
- Almaqtari, F.A., E.A. Al-Homaidi, M. I. Tabash, and N. H. Farhan, 2019. The determinants of profitability of Indian commercial banks: A panel data approach. *International Journal of Finance and Economics* 24(1), 160-185
- Al-Rdaydeh, M., A. Matar, and O. Alghzwai, 2017. Analyzing the effect of credit and liquidity risks on profitability

- of conventional and Islamic Jordanian banks. *International Journal of Academic Research in Business and Social Sciences* 7(12), 1145-1155.
- 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.
- Barnor, C., and T. A. Odonkor, 2012. Capital adequacy and the performance of Ghanaian banks. *Journal of Business Research* 6(2), 105-117.
- Berniz, Y. M., N. Najmudin, E. Jayanti, I. Y. Rahmawati, and Y. Utami, 2023. The influence of third-party funds, asset quality, profit and lost sharing to the Islamic bank liquidity in Indonesia. *International Journal of Science, Technology and management* 4(4), 1023-1033.
- Chou, T. K., and A. D. Buchdadi, 2016. Bank performance and its underlying factors: A study of rural banks in Indonesia. *Accounting and Finance Research* 5(3), 55-63.
- Dadhich, M., V. Chouhan, S. K. Gautam, and R. Mwinga, 2020. Profitability and capital adequacy approach for measuring impact of global financial crisis vis-à-vis Indian banks. *International Journal of Advanced Science and Technology* 29(4), 2344-2365.
- Damayanti, P., and D. A. M. Savitri, 2018. Analisis pengaruh ukuran, capital adequacy ratio, pertumbuhan deposit, loan to deposit rasio, terhadap profitabilitas perbankan go public di Indonesiatahun 2005–2009. *Jurnal Ilmu Manajemen Dan Akuntansi Terapan* 3(2), 45-54.
- 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.
- Fitri, A., and E. Sisdianto, 2020. Analysis of third parties' funds and inflation to profitability (Survey on Commercial Bank Shariah Period (2013-2018). Hunafa: *Jurnal Studia Islamika* 17(1), 1-18.
- 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.
- Hapsari, I., 2018. Moderating role of size in the effect of loan to deposit ratio and non-performing loan toward banking financial performance. *Advances in Social Science, Education and Humanities* 231(1), 351-354.
- Hersugondo, H., N. Anjani, and I. D. Pamungkas, 2021. The role of non-performing asset, capital, adequacy and insolvency risk on bank performance: a case study in Indonesia. *The Journal of Asian Finance, Economics and Business* 8(3), 319-329.
- 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), 35-52.
- Le, T. D., and T. Ngo, 2020. The determinants of bank profitability: A cross-country analysis. *Central Bank Review* 20(2), 65-73.
- Liyana, L., and E. Indrayani, 2020. The effect of non-performing loan (NPL), loan to deposit ratio (LDR) and net interest margin (NIM) on financial performance (ROA) with car as intervening variables on go public commercial banks in Indonesia and listed on BEI period 2014-2018. *Asian Journal of Social Science and Management Technology* 2(2), 61-75.
- Magdalena, A., B. S. Marpaung, and E. M. Indira, 2019. The effects of bank funds sources on bank profitability in Indonesian Stock Exchange. *Riset: Jurnal Aplikasi Ekonomi Akuntansi dan Bisnis* 1(2), 90 - 98.
- Margono, H., M. K. Wardani, and J. Safitri, 2020. Roles of capital adequacy and liquidity to improve banking performance. *The Journal of Asian Finance, Economics and Business* 7(11), 75-81.
- 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
- Neupane, B. P., 2020. Profitability determinants of Nepalese commercial banks. *Press Academia Procedia* 12(1),

40-45.

- Parvin, S., A. N. Chowdhury, A. Siddiqua, and J. Ferdous, 2014. Effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. *Asian Business Review* 9(1), 1-10.
- Pavkovic, A., A. Cesarec, and A. Stojanović, 2018. Profitability and efficiency of the Croatian banking sector: impact of bank size. *International Journal of Trade and Global Markets* 11(4), 243-258.
- 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.
- 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.
- Shabri, H., and A. Azhari 2021. Profitability of Islamic rural banks in west Sumatra: analysis of the third-party funds and financial ratios. *Ekonomika Syariah: Journal of Economic Studies* 5(2), 112-123.
- Shihadeh, F., and B. Liu, 2019. Does financial inclusion influence the banks risk and performance? Evidence from global prospect. *Academy of Accounting and Financial Studies Journal* 239(3), 1-12
- 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., and M. S. Habibullah, 2009. Determinants of bank profitability in a developing economy: Empirical evidence from Bangladesh. *Journal of Business Economics and Management* 10(3), 207-217.
- 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.
- Terraza, V., 2015. The effect of bank size on risk ratios: Implications of banks' performance. *Procedia Economics and Finance* 30(1), 903-909.
- Tsolas, I. E., 2010. Modeling bank branch profitability and effectiveness by means of DEA. *International Journal of Productivity and Performance Management* 59(5), 432-451.
- Velnampy, T. and B. Nimalathasan, 2010. Firm size on profitability: A comparative study of Bank of Ceylon and Commercial Bank of Ceylon Ltd in Sri Lanka. *Global Journal of Management and Business Research* 10(2), 96-103.
- Witjaksono, A. and J. K. P. Natakusumah, 2020. Analysis of the effect of third-party funds, capital adequacy ratio, non performing financing, operational expenses and operational income (BOPO) on the profitability of Sharia banks (Evidence from Indonesia). *Advances in Social Science, Education and Humanities Research* 58(5), 1-7
- Yuhasril, Y., 2019. The effect of capital adequacy ratio (CAR), non-performing loan (NPL), operational efficiency (BOPO), net interest margin (NIM), and loan to deposit ratio (LDR), on return on assets (ROA). *Research Journal of Finance and Accounting* 10(1), 166-176.
- Zaman, K., S. Javaid, J. Anwar, and A. Ghafoor, 2011. Determinants of bank profitability in Pakistan: internal factor analysis. *Yaşar Üniversitesi E-Dergisi* 6(23), 3794-3804.

Chapter 4

Impact of Interest Rate Spread, Capital Adequacy, Credit Risks, Deposit Growth and Ownership Structure on the Profitability of Nepalese Commercial Banks

Prashant Chaudhary*

Abstract

This study examines the impact of interest rate spread, capital adequacy, credit risks, deposit growth and ownership structure 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 interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, and institutional ownership. The study is based on secondary data of 12 commercial banks with 108 observations for the study period from 2011/15 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 spread, capital adequacy, credit risks, deposit growth and ownership structure on profitability of Nepalese commercial banks.

The study showed that interest rate spread has a positive impact on return on assets and return on equity. It indicates that increase in interest rate spread leads to increase in return on assets and return on equity. Similarly, 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, loan to deposit ratio has a negative impact on return on assets and return on equity. It indicates that increase on loan to deposit ratio leads to decrease in return on assets and return on equity. Further, 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. In addition, deposit growth rate has a positive impact on return on assets and return on equity. It indicates that increase in deposit growth rate leads to increase in return on assets and return on equity. Moreover, institutional ownership has a positive impact on return on assets and return on equity. It indicates that increase in institutional ownership leads to increase in return on assets and return on equity.

Keywords: interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, institutional ownership, return on assets, return on equity

1. Introduction

Poor bank performance led to failure and financial crises that have negative consequences for economic development (Nuhui *et al.*, 2017). 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

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

capacity to earn profit and bigger contribution to the economic growth (Adiatmayani and Panji, 2021). According to Handriani and Robiyanto (2018), profitability is one of the most important goals of financial management besides maximizing the owner's wealth. In the banking industries, profitability is considered as the most accurate indicator to measure the bank performance using instruments, such as return on assets (ROA) and net interest margin (NIM). According to Cuac *et al.* (2020), operational costs to operational income (BOPO) measures the level of a bank's ability to operate. Liquidity risk basically originates due to the weak deposit base of a bank. Further, Fahrul and Rusliati (2016) showed that operational risk and liquidity risk have significant effect on the profitability of banks. A healthy and sustainable profitability is essential for the stability, resilience, and continued functioning of the banking system, supporting economic growth and prosperity. Financial institutions play an important role in the management and circulation of capital in the economy. In addition, Athanasoglou *et al.* (2008) stated that the banking sector acts as the life blood of modern trade and commerce to provide them with a major source of finance. Banks largely depend on competitive marketing strategy that determines their success and growth (Sukmadewi, 2020).

Adequate capital provides a buffer against unexpected losses. Banks with higher levels of capital can absorb losses from non-performing loans, market volatility, or operational failures without jeopardizing their solvency. This allows them to maintain stability and confidence among investors and depositors. Witjaksono and Natakusumah (2020) examined the effect of third-party funds, capital adequacy ratio, non-performing financing, operational expenses and operational income (BOPO) on the profitability of Sharia banks. The study showed that capital adequacy and the comparison of operating expenses to operating income have a significant impact on profitability. Similarly, Arasy and Sri (2020) stated that capital adequate provide a protection against the insolvency and liquidation arising from the risks that the bank is facing. Higher the CAR, the more flexible the bank is to place funds in risky productive assets. Higher CAR reflects the greater the capital owned by the bank so that it affects the level of public trust which leads to an increase in bank profits (Sari and Endri, 2019). Likewise, Al-Sharkas and Al-Sharkas (2022) analyzed the impact of capital adequacy ratios on bank profitability in a Jordanian. The study found that return on assets is negatively correlated with capital adequacy ratios. Further, Spaseska *et al.* (2022) investigated the impact of capital adequacy ratio on banks' profitability in the Republic of North Macedonia. The study found that there is a positive relationship between capital adequacy ratio (CAR) and return on average assets (ROA). In addition, Gupta and Mahakud (2020) assessed the ownership, bank size, capitalization and bank performance in India. The study revealed that private sector banks are more profitable than the public sector banks. Moreover, Hasmiana and Pintor (2022) examined the effect of financial risk, capital structure, banking liquidity on profitability: Operational efficiency as intervening variables in Persero bank and private commercial banks. The study concluded that increase in non-performing loan interrupts and decline in lending to the public and consequently affect the bank's profitability.

Do *et al.* (2020) analyzed the effect of non-performing loan on profitability of commercial bank of Vietnam. The study found that non-performing loans have negative impact on bank's profitability. Likewise, Psaila *et al.* (2019) analyzed the impact of NPLs on listed commercial bank's profitability. The result revealed that there is a negative impact of non-performing loans on return on assets. Further, Oudat and Ali (2020) examined the effect of bad debt, market capitalization, operation cost, capital adequacy, cash reserves on financial performance. The result revealed that there is an insignificant relationship between market capitalization and profitability. Moreover, Maigua *et al.* (2016) stated that there is a negative relationship between interest spread rate and profitability of commercial banks. Similarly, Vodova (2016) found that the relation is not in accordance with standard finance theory which emphasizes negative link between liquidity and profitability. Likewise, Samad (2015) stated that loan

to deposit ratio (bank liquidity), loan loss provision to total assets ratio (credit risk), equity capital to total assets (capital risk) and operating expenses (bank efficiency) have statistically significant impact on profitability measured by return on assets and return on equity. Further, Vong and Anna (2009) examined the impact of bank characteristics as well as macro-economic and financial structure variable on the performance the macro banking industry. The study indicated that capital strength of a bank has a positive impact on bank's profitability. In addition, John and Oke (2013) assessed the effect of Basel capital standard on the performance of selected commercial banks in Nigeria using the ordinary least square method. The study revealed that capital adequacy standard exerts a major influence on bank performance. Moreover, Asikhia and Sokefun (2013) analyzed the effect of capital adequacy on the profitability of Nigerian banks. The study showed a positive and significant relationship between capital adequacy ratio and banks' profitability. Similarly, Ikpefan (2013) examined the impact of capital adequacy, management and performance of Nigerian commercial banks. The study showed that shareholders fund/total assets which measured capital adequacy of bank (risk of default) have negative impact on return on assets.

Rizky and Rasyidi (2014) investigated the effect of capital adequacy ratio, loan-to-deposit ratio, non-performing loan, bi rate and inflation on return on assets in Bum banking. The study showed that capital adequacy ratio has a significant impact on return on assets. The study also showed that loan-to-deposit ratio and non-performing loan have significant impact on return on assets. Similarly, Gunardy *et al.* (2024) examined the influence of investment policy ratio, net profit margin, loan-to-deposit ratio, and capital adequacy ratio. The study showed that investing policy ratio and net profit margin have no impact on return on assets. However, Putri *et al.* (2024) argued that loan-to-deposit ratio has no significant impact on return on assets, non-performing loan has no significant impact on return on assets. Likewise, Qin and Pastory (2012) indicated that liquidity and asset quality have positive impact on profitability but level of non-performing loans and capital adequacy have negative impact on profitability of the banks. Further, Ramadhanti *et al.* (2019) examined the effect of capital adequacy, liquidity, and credit risk to profitability of commercial banks. The study revealed that capital adequacy ratio has a significant positive impact on profitability. However, non-performing loan has a negative and significant impact on profitability of the banks. In addition, Solihati (2020) analyzed the factors affecting banking profitability. The results revealed that non-performing loan and capital adequacy ratio have significant impact on return on assets. Meanwhile, capital adequacy ratio is not significantly affected by return on assets.

Institutional ownership is the type of ownership structure. It is the ratio of the total shares in the authority of banks, insurance companies, holdings, investment companies, pension funds, financing companies, investment funds, organizations, government institutions, and state-owned companies to the total issued shares of the company (Martinez *et al.*, 2021). Decision making is subordinate to one of the institutions mentioned (Abbassi *et al.*, 2021). If this ratio is greater than the average ratio of total institutional ownership, it takes 1, otherwise 0 (Huo *et al.*, 2021). Thus, it is the ratio of the total shares owned by companies or institutions to the paid-in capital of other companies (Fallah, 2021). Institutional ownership also plays a clear role in monitoring management and enhancing the efficiency of the information disclosed in the financial market (Du *et al.*, 2021). Institutional ownership also gives the ability to monitor management to achieve goals (Satt *et al.*, 2021). Institutional ownership raises the level of liquidity in the company for the longest possible time (Dasgupta *et al.*, 2021). Doku *et al.* (2019) examined the effect of capital structure and bank performance in Ghana. The results of the study showed that there is a positive relationship between deposits and bank performance. Similarly, Homaidi *et al.* (2018) showed that there is a positive and significant relationship between deposit and bank performance. Further, Rasyid (2019) examined the influence of ownership structure, financial capital structure, profitability and company growth toward firm. The study showed that institutional

ownership has a significant impact on firm value. In addition, Dakhllalh *et al.* (2021) investigated the relationship between the ownership structure and firm performance in developing countries like Jordan. The study stated that institutional ownership has a positive influence over firm performance.

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 and an insignificant impact on bank performance measured by return on assets (ROA). Similarly, 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. 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. Similarly, Pradhan and Parajuli (2017) analyzed the effect of capital adequacy and cost income ratio on the performance of Nepalese commercial banks. The study showed that capital adequacy ratio, cost income ratio, equity capital to total assets ratio and liquidity ratio has significant impact on profitability measured by return on assets. Likewise, Gnawali (2018) assessed the non-performing asset and its effects on profitability of Nepalese commercial banks. The study found that there is a negative impact of non-performing loan on return on assets in context of Nepalese government banks. 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.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of interest rate spread, capital adequacy, credit risks, deposit growth and ownership structure 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 spread, capital adequacy, credit risks, deposit growth and ownership structure on profitability of Nepalese commercial banks. Specifically, it examines the relationship of interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, and institutional ownership 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 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	Year	Observations
1	Nepal Bank Limited	2014/15-2022/23	9
2	NMB bank Limited	2014/15-2022/23	9
3	Himalayan Bank Limited	2014/15-2022/23	9
4	Everest Bank Limited	2014/15-2022/23	9
5	Machhapuchchhre Bank Limited	2014/15-2022/23	9
6	Sanima Bank Limited	2014/15-2022/23	9
7	Siddhartha Bank Limited	2014/15-2022/23	9
8	Prime Commercial Bank Limited	2014/15-2022/23	9
9	Citizens Bank International Limited	2014/15-2022/23	9
10	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
11	Rastriya Banijya Bank Limited	2014/15-2022/23	9
12	Agricultural Development 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 interest rate spread, capital adequacy, credit risks, deposit growth, and ownership structure. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, and institutional ownership. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 IRS + \beta_2 CAR + \beta_3 LDR + \beta_4 NPL + \beta_5 DGR + \beta_6 IO + e_{it}$$

$$ROE = \beta_0 + \beta_1 IRS + \beta_2 CAR + \beta_3 LDR + \beta_4 NPL + \beta_5 DGR + \beta_6 IO + e_{it}$$

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.

IRS = Interest rate spread as measured by the weighted average interest rate spread, in percentage.

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

LDR = Loan to deposit ratio as measured by total loan to total deposit, in percentage.

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

DGR = Deposit growth rate as measured by change in deposit to previous year deposit, in percentage.

IO = Institutional ownership as measured by total number of shares owned by institutions to total number of shares, in percentage.

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

Interest rate spread

Interest rate spread is a key determinant of a financial institution's profitability. Khan (2014) examined the impact of interest rate changes on profitability. The study showed that profitability of banks is positive affected by interest rates. Similarly, Maigua *et al.* (2016) assessed the influence of interest rates on the performance of commercial banks. The study showed that there is an optimistic and direct relationship between interest rate and banks' profitability when the banks charged high interest rates from their customers then they obtain higher profitability and vice versa. In addition, Poudel (2018) analyzed the impact of interest rate spread on profitability. The study stated that there is a positive relationship between interest rate spread and the profitability of commercial banks. Likewise, Noreen *et al.* (2018) examined 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 bank's profitability.

Capital adequacy ratio

Capital adequacy ratio is measured as the summation of primary and supplementary capital divided by risk weighted assets. Capraru *et al.* (2014) assessed the determinants of banks' profitability. The study showed that capital adequacy ratio has a positive impact on return on assets and return on equity. Similarly, Barus *et al.* (2017) investigated the effect of capital adequacy on the financial performance of savings and credit societies in Kenya. The study revealed that there is a positive relationship between capital adequacy ratio and profitability of the banks. Likewise, Kamande *et al.* (2017) examined the effect of bank specific factors on financial performance of commercial banks in Kenya. The results showed that there is a positive and significant association between return on assets and capital adequacy ratio. Further, Spaseska *et al.* (2022) revealed that there is a positive but statistically an insignificant relationship between capital adequacy ratio and the return on average assets. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between capital adequacy ratio and bank's profitability.

Loan to deposit ratio

Loan-to-deposit ratio as measured by the total loan to total deposit. Kolapo *et al.* (2012) analyzed the influence of credit risk on the performance of Nigerian commercial banks. The study showed an inverse impact of credit risk on performance of bank. Similarly, Inggawati *et al.* (2018) examined the influence of loan-to-deposit ratio, operational cost to operational income, and non-performing loan toward profitability of bank. Likewise, Hasan *et al.* (2020) assessed the determinants of bank profitability with size as moderating variable of Indonesian banks. The study showed that there is a significant and positive impact of credit to deposit ratio on return on assets. However, there is a significant but negative impact on loan-to-deposit ratio on return on equity. In addition, Nugraha *et al.* (2021) examined the impact of non-performing loans, loan-to-deposit ratio and education diversity on firm performance of Indonesia banking sectors for the period of 2015-2019. The study showed that non-performing loan, the loan-to-deposit ratio and education diversity simultaneously have significant impact on return on assets. Partially, non-performing loans have a significant negative impact on return on assets, and the loan-to-deposit ratio has a significant and positive impact on return

on assets. Likewise, Sihotang *et al.* (2022) analyzed the influence of internal and external factors on profitability as proxies by return on assets. The study stated that there is a positive and significant relationship between loan-to-deposit ratio and return on assets. Further, 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. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between loan-to-deposit ratio and bank's profitability.

Non-performing loan

Non-performing loans are measured as the percentage of non-performing loans to total loans. Serwadda (2018) analyzed the impact of credit risk management on the financial performance of commercial banks in Uganda for a period of 2006-2015 using panel data. The study portrayed that there is a negative significant relationship between non-performing loans and banks' performance measured by return on assets. Similarly, Patwary and Tasneem (2019) showed that non-performing loan has a negative impact on return on assets. Likewise, Ologunla and Asaolu (2020) examined the impact of non-performing loan on profitability of deposit money banks in Nigeria. The study stated that non-performing loan has a significant impact on the profitability of deposit money banks in Nigeria. Further, Cuaca *et al.* (2020) assessed the effect of capital adequacy ratio, non-performing loan, and operational cost to operating income on profitability. The study showed that non-performing loan and operating costs to operating income have significant impact on return on assets. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between non-performing loan and bank's profitability.

Deposit growth rate

Deposit growth rate is the rate of change in current year's deposit than last year's deposit. Lamothe *et al.* (2024) showed that there is a positive relationship between deposit ratio and return on assets and return on equity. However, Kim *et al.* (2023) investigated the effect of capital structure and bank liquidity on bank performance. The study showed that there is a negative relationship between deposit and bank performance. Similarly, Doku *et al.* (2019) examined the effect of capital structure and bank performance in Ghana. The study showed that there is a positive relationship between deposits and bank performance. Likewise, Homaidi *et al.* (2018) revealed that there is a positive and significant relationship between deposit ratio and bank performance. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between deposit growth rate and bank's profitability.

Institutional ownership

Institutional ownership is the ownership stake in a company that is held by large financial organizations. Rasyid (2019) examined the effects of ownership structure, capital structure, profitability and company's growth towards firm value. The study showed that managerial ownership, institutional ownership, debt to equity ratio, return on equity and earnings growth simultaneously have significant impact on firm value. Similarly, Rashid (2020) investigated the mediating role of corporate board characteristics in the relationship between ownership structure and firm performance in the listed public limited companies of Bangladesh. The study revealed that board size and board independence partially mediate the relationship between ownership structure and firm performance. Likewise, Dakhilallh *et al.* (2021) assessed the relationship between the ownership structure and firm performance in developing

countries like Jordan. The study found that institutional ownership has a positive influence over the firm performance. Further, Dana (2015) investigated whether institutional ownership affects the firm's performance for one of the emerging markets, Jordan. The study showed that there is no strong evidence that there is a relationship between both institutional ownership and firm performance for Jordanian listed firms. Based on it, this study develops the following hypothesis:

H_6 : There is a positive relationship between institutional ownership 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 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 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 ISR (Interest rate spread as measured by the weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by total loan to total deposit, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), DGR (Deposit growth rate as measured by change in deposit to previous year deposit, in percentage), and IO (Institutional ownership as measured by total number of shares owned by institutions to total number of shares, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.22	1.62	0.54
ROE	3.78	33.11	15.12	5.16
IRS	3.09	7.15	4.27	0.64
CAR	7.49	22.99	13.94	2.54
LDR	48.92	107.01	83.4	9.58
NPL	0.01	5.35	1.65	1.4
DGR	-3.3	76.41	19.11	12.84
IO	0	65	10.73	17.12

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 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 ISR (Interest rate spread as measured by the weighted average interest

rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by total loan to total deposit, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), DGR (Deposit growth rate as measured by change in deposit to previous year deposit, in percentage), and IO (Institutional ownership as measured by total number of shares owned by institutions to total number of shares, in percentage).

Variables	ROA	ROE	IRS	CAR	LDR	NPL	DGR	IO
ROA	1							
ROE	0.492**	1						
IRS	0.402**	0.187**	1					
CAR	0.310**	0.199**	0.185	1				
LDR	-0.192*	-0.331*	-0.138**	0.58	1			
NPL	-0.412	-1.552	0.404**	-0.053	-0.079	1		
DGR	0.811	0.126	-0.142	-0.195*	-0.024	-0.88	1	
IO	0.014	0.065	-0.067	-0.185	-0.107	-0.190*	-0.020	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 interest rate spread and return on assets. It indicates that increase in interest rate spread leads to increase in return on assets. Similarly, there is a positive relationship between capital adequacy ratio and return on assets. It indicates that higher the capital adequacy ratio, higher would be the return on assets. Likewise, loan-to-deposit ratio has a negative relationship with return on assets. It indicates that increase in loan-to-deposit ratio 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. Furthermore, deposit growth rate has a positive relationship with return on assets. It indicates that higher the deposit growth rate, higher would be the return on assets. Moreover, there is a positive relationship between institutional ownership and return on assets. It indicates that higher the institutional ownership, higher would be the return on assets.

On the other hand, the result shows that there is a positive relationship between interest rate spread and return on equity. It indicates that increase in interest rate spread leads to increase in return on equity. Similarly, there is a positive relationship between capital adequacy ratio and return on equity. It indicates that higher the capital adequacy ratio, higher would be the return on equity. Likewise, loan-to-deposit ratio has a negative relationship with return on equity. It indicates that increase in loan-to-deposit ratio leads to decrease in return on equity. In addition, 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. Furthermore, deposit growth rate has a positive relationship with return on equity. It indicates that higher the deposit growth rate, higher would be the return on equity. Moreover, there is a positive relationship between institutional ownership and return on equity. It indicates that higher the institutional ownership, 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 5. More specifically, Table 4 shows the regression results of interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, and institutional ownership with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate and institutional ownership with return on assets of Nepalese commercial banks

The results are based on panel data of 12 Nepalese commercial banks with 108 for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 IRS + \beta_2 CAR + \beta_3 LDR + \beta_4 NPL + \beta_5 DGR + \beta_6 IO + e_{it}$ 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 ISR (Interest rate spread as measured by the weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by total loan to total deposit, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), DGR (Deposit growth rate as measured by change in deposit to previous year deposit, in percentage), and IO (Institutional ownership as measured by total number of shares owned by institutions to total number of shares, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		CAR	TPF	LTD	BS	NOB	LAR			
1	0.183 (0.569)	0.337 (4.527)**						0.154	0.493	20.491
2	0.711 (2.575)**		0.065 (3.356)**					0.088	0.512	11.26
3	2.517 (5.619)**			-0.011 (2.011)*				0.028	0.529	4.045
4	1.596 (19.872)**				-0.016 (0.426)			0.008	0.539	0.182
5	1.686 (0.003)					0.003 (0.833)		0.003	0.537	0.694
6	1.627 (26.551)**						0.257 (0.148)	0.009	0.539	0.022
7	0.373 (1.008)	0.321 (4.074)**	0.51 (2.781)**					0.205	0.478	14.76
8	0.425 (0.753)	0.279 (3.792)**	0.054 (2.962)**	-0.009 (1.862)				0.223	0.473	11.23
9	0.374 (0.663)	0.319 (3.952)**	0.051 (2.771)**	-0.009 (1.880)	-0.043 (1.194)			0.226	0.472	8.809
10	0.361 (0.613)	0.319 (3.927)**	0.052 (2.728)**	-0.009 (1.867)	-0.043 (1.181)	0.012 (0.082)		0.218	0.474	6.981
11	0.335 (0.566)	0.316 (3.863)**	0.054 (2.796)**	-0.009 (1.923)	-0.0358 (1.012)	0.012 (0.129)	0.002 (0.647)	0.214	0.476	5.85

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 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 finding of Khan (2014). Similarly, 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 finding of Capraru *et al.* (2014). 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 not consistent with the finding of Kolapo *et al.* (2012). Further, 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 Serwadda (2018). In addition, the beta coefficients for deposit growth rate are positive with return on assets. It indicates that deposit growth rate has a positive impact on return on assets. This finding is consistent with the finding of Doku *et al.* (2019). Likewise, the beta coefficients for institutional ownership are positive with return on assets. It indicates that institutional ownership has a positive

impact on return on assets. This finding is similar to the findings of Rasyid (2019).

Table 5 shows the regression results of interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate, and institutional ownership with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of interest rate spread, capital adequacy ratio, loan-to-deposit ratio, non-performing loan, deposit growth rate and institutional ownership with return on equity of Nepalese commercial banks

The results are based on panel data of 12 Nepalese commercial banks with 108 for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 IRS + \beta_2 CAR + \beta_3 LDR + \beta_4 NPL + \beta_5 DGR + \beta_6 IO + e_t$ 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 IRS (Interest rate spread as measured by the weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by total loan to total deposit, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), DGR (Deposit growth rate as measured by change in deposit to previous year deposit, in percentage), and IO (Institutional ownership as measured by total number of shares owned by institutions to total number of shares, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		IRS	CAR	LDR	NPL	DGR	IO			
1	8.681 (2.616)**	1.509 (1.961)						0.026	5.094	3.847
2	20.734 (7.576)**		0.403 (2.086)*					0.03	5.083	4.351
3	29.977 (7.234)**			-0.178 (3.609)**				0.101	4.894	13.028
4	16.057 (21.020)**				-0.568 (1.611)			0.015	5.123	2.595
5	14.152 (15.890)**					0.051 (1.304)		0.006	5.145	1.699
6	14.906 (25.337)**						0.022 (0.672)	0.005	5.175	0.452
7	13.974 (3.635)**	1.868 (2.448)*	0.492 (2.554)**					0.074	4.967	5.274
8	27.951 (4.929)**	1.505 (2.035)*	0.438 (2.375)*	-0.158 (3.241)**				0.151	4.756	7.335
9	26.555 (4.908)**	2.613 (3.378)**	0.524 (2.956)**	-0.162 (3.451)**	-1.186 (3.446)**			0.231	4.526	9.044
10	24.967 (4.442)**	2.676 (3.451)**	0.491 (2.726)**	-0.158 (3.148)**	-1.164 (3.377)**	0.036 (1.039)		0.232	4.454	7.457
11	24.894 (4.398)**	2.666 (3.414)**	0.483 (2.618)**	-0.159 (3.402)**	-1.149 (3.243)**	0.037 (1.046)	0.005 (0.191)	0.224	4.545	6.162

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 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 similar to the finding of Maigua *et al.* (2016). Similarly, 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 consistent with the finding of Kamande *et al.* (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 not consistent with the finding of Hasan *et al.* (2020). Further, 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 Ologunla and Asaolu (2020). In addition, the beta coefficients for deposit growth rate are positive with return on equity. It indicates that deposit growth rate has a positive impact on return on equity. This finding is consistent with the finding of Kim *et al.* (2023). Likewise, the beta coefficients for institutional ownership are positive with return on equity. It indicates that institutional ownership has a positive impact on return on equity. This finding is similar to the findings of Dakhllalh *et al.* (2021).

4. Summary and conclusion

Banking sectors play a key role in the development of an economy. If the banking industries does not perform well, the effect to the economy could be huge and broad. Thus, banks are a critical part of financial system, which play a pivotal role in contributing to country's economic development. The existence of the banking sector becomes important because in carrying out life in the community involves services from the banking sector. The financial institution that has a business license to accept the placement of funds entrusted by the community to the bank, lending to the public and the business world in general, giving acceptance of various forms of debt securities submitted to the bank and issuing cheques.

This study attempts to analyze the impact of interest rate spread, capital adequacy, credit risks, deposit growth and ownership structure on the 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 interest rate spread, capital adequacy ratio, deposit growth rate, and institutional ownership have positive impact on return on assets and return on equity. It indicates that increase in interest rate spread, capital adequacy ratio, deposit growth rate, and institutional ownership have positive impact on return on assets and return on equity. However, loan-to-deposit ratio and non-performing loan have negative impact on return on assets and return on equity. It indicates that higher the loan-to-deposit ratio and non-performing loan, lower would be the return on assets and return on equity. Likewise, the study also concluded that interest rate spread followed by institutional ownership 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 interest rate spread followed by capital adequacy ratio is the most influencing factor that explains the changes in return on equity in the context of Nepalese commercial banks.

References

- Abbassi, W., A. I., Hunjra, S. M., Alawi, and R., Mehmood, 2021. The role of ownership structure and board characteristics in stock market liquidity. *International Journal of Financial Studies* 9(4), 74-95.
- 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.
- 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), 15-24.
- 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.

- Arasy, R. A., and S. S. Handayani, 2020. Influence of capital adequacy ratio, loan to deposits ratio, operational efficiency ratio, and non-performing loan on return on assets of SOES bank in 2016 to 2018. *International Journal of Economics, Commerce and Management* 8(6), 308-320.
- Asikhia, O., and A., Sokefun, 2013. Capital adequacy and banks profitability: An empirical evidence from Nigeria. *American International Journal of Contemporary Research* 3(10), 87-93.
- 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.
- Barus, J. J., W. Muturi, P. Kibati, and J. Koima, 2017. Effect of capital adequacy on the financial performance of savings and credit societies in Kenya. *American Journal of Finance* 1(4), 1-12.
- Capraru, B., and I. Ihnatov, 2014. Banks' profitability in selected Central and Eastern European countries. *Procedia Economics and Finance* 16(1), 587-591.
- 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.
- Cuaca, C., I. Simangunsong, A. Maharani, and I. R. Sari, 2020. The influence of capital adequacy ratio, non-performing loan, and operating costs operating income on profitability in banks listed on the Indonesia stock exchange for the 2016-2018 period. *Journal of Research in Business, Economics, and Education* 2(5), 1206-1223.
- Cuaca, C., I. Simangunsongm, A. Maharani, and I. R. Sari, 2020. The influence of capital adequacy ratio (CAR), non-performing loan (NPL), and operating costs operating income on profitability in banks listed on the Indonesia stock exchange for the 2016-2018 period. *Journal of Research in Business, Economics, and Education* 2(5), 1206-1223.
- Dakhlalh, M. M., N. Rashid, W. A. W. Abdullah, and A. M. Dakhlalh, 2021. Ownership structure and firm performance: Evidence from Jordan. *The Journal of Contemporary Issues in Business and Government* 27(2), 79-90.
- Dana, A. N., 2015. The effect of institutional ownership on firm performance: Evidence from Jordanian listed firms. *International Journal of Economics and Finance* 7(12), 97-105.
- Dasgupta, A., V. Fos, and Z. Sautner, 2021. Institutional investors and corporate governance. *Foundations and Trends in Finance* 12(4), 276-394.
- 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.
- Doku, J. N., F. A. Kpekpena, and P. Y. Boateng, 2019. Capital structure and bank performance: Empirical evidence from Ghana. *African Development Review* 31(1), 15-27.
- Du, J., T. Mickiewicz, and M. Douch, 2021. Individual and institutional ownership, firm age and productivity. *Journal of Competitiveness* 13(1), 23-41.
- Fahrul, M., and E. Rusliati, 2016. Credit risk, market risk, operational risk and liquidity risk on profitability of banks in Indonesia. *Trikonomkia* 15(2), 78-88.
- Fallah, R., 2021. Study of the effect of institutional ownership on accounting quality and cost of capital. *Propósitos y Representaciones* 17(4), 81-90.

- 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.
- Gunardy, F. D. L., M. C. Dewi, S. Dini, and A. Anggono, 2024. The effect of investing policy ratio, net profit margin, loan-to-deposit ratio and return on asset on capital adequacy ratio in banking companies listed in the Indonesia stock exchange. *International Journal of Economics Development Research* 5(1), 631-646.
- Gupta, N., and J. Mahakud, 2020. Ownership, bank size, capitalization and bank performance: Evidence from India. *Cogent Economics and Finance* 8(1), 1-39.
- Handriani, E., and R. Robiyanto, 2018. Investment opportunity and industrial growth in Indonesia. *International Journal of Business and Society* 19(2), 21-32.
- Hasan, M. S. A., A. H. Manurung, and B. Usman, 2020. Determinants of bank profitability with size as moderating variable. *Journal of Applied Finance and Banking* 10(3), 153-166.
- Hasmiana, M., and S. Pintor, 2022. The effect of financial risk, capital structure, banking liquidity on profitability: Operational efficiency as intervening variables in Persero bank and private commercial banks. *International Journal of Arts and Social Science* 5(1), 226-234.
- Ikpefan, O. A., 2013. Capital adequacy, management and performance in the Nigerian commercial bank. *African Journal of Business Management* 7(30), 2938-2950.
- 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 Perkreditasi Rakyat in Sidoarjo Regency. *International Journal of Scientific and Research Publications* 8(11), 510-519.
- John, E. E., and M. O. Oke, 2013. Capital adequacy standard Bable accord and bank performance. The Nigerian experience (A case study of selected banks). *Asian Economic and Financial Review* 3(2), 146-159.
- 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.
- Kim, Y., S. Jung, and C. Kim, 2023. The impact of capital structure on the profitability performance of ICT Firms. *Processes* 11(2), 635-649.
- Kolapo, T. F., R. K. Ayeni, and M. O. Oke, 2012. Credit risk and commercial banks' performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research* 2(2), 31-38.
- Lamothe, P., E. Delgado, M. A. Solano, and S. M. Fernandez, 2024. A global analysis of bank profitability factors. *Humanities and Social Sciences Communications* 11(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.
- Martinez-Ferrero, J., M. B. Lozano, and M. Vivas, 2021. The impact of board cultural diversity on a firm's commitment toward the sustainability issues of emerging countries: The mediating effect of a CSR committee. *Corporate Social Responsibility and Environmental Management* 28(2), 675-685.
- Mittal, M., and A. Dhade, 2007. Profitability and productivity in Indian banks: A comparative study. *AIMS International* 1(2), 137-152.
- Noreen, S., A. Liaqat, and 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.

- Nugraha, N. M., A. Yahya, T. T. 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* 11(3), 85-96.
- 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.
- Ologunla, S. E., and T. M. Asaolu, 2020. Impact of non-performing loan on profitability of deposit money banks in Nigeria. *Journal of Economics and Allied Studies* 4(2), 1-11.
- Oudat, M. S., and B. J. Ali, 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), 5979-5986.
- Panta, B., 2018. 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.
- Patwary, M. S. H., and 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* 1(1), 1-17.
- 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.
- 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.
- Psaila, A., J. Spiteri, and S. Grima, 2019. The impact of non-performing loans on the profitability of listed Euro-Mediterranean commercial banks. *International Journal of Economics and Business Administration* 7(4), 166-196.
- Putri, H. T., M. Amali, and A. Masyhuri, 2024. The effect of loan-to-deposit ratio and non-performing loans on stock prices with return on assets as an intervening variable at regional development banks. *Journal of Economics and Business* 8(1), 902-910.
- Qin, X., and D. Pastory, 2012. Commercial banks profitability position: The case of Tanzania. *International Journal of Business of Management* 3(7), 136-144.
- Ramadhanti, C., M. Marlina, and S. Hidayati, 2019. The effect capital adequacy, liquidity and credit risk to profitability of commercial banks. *Journal of Economics, Business, and Government Challenges* 2(1), 71-78.
- Rashid, M. M., 2020. Ownership structure and firm performance: the mediating role of board characteristics. *The International Journal of Business in Society* 20(4), 719-737.
- Rasyid, A., 2019. Effects of ownership structure, capital structure, profitability and company's growth towards firm value. *International Journal of Business and Management Invention* 4(4), 25-31.
- Rizky, S., and N. H. Rasyidi, 2014. The influence of capital adequacy ratio (CAR), loan-to-deposit ratio (LDR), non-performing loan (NPL), BI rate and inflation on return on assets (ROA). *Journal of Business Transformation and Strategy* 1(1), 37-47.
- Samad, A., 2015. Determinants of bank profitability: Empirical evidence from Bangladesh commercial banks. *International Journal of Financial Research* 6(3), 173-179.
- Sari, F. N., and E. Endri, 2019. Determinants of return on assets on conventional banks listed on Indonesian stock exchange (IDX) period 2013-2017. *Journal of Business and Management* 21(4), 52-62.

- Satt, H., S. Nechbaoui, M. K. Hassan, and Z. A. Halim, 2021. Institutional ownership and firm performance: The case of Morocco. *Macroeconomics and Finance in Emerging Market Economies* 9(2), 158-205.
- 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.
- 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.
- Sihotang, M. K., U. Hasanah, and I. Hayati, 2022. Model of Sharia bank profitability determination factors by measuring internal and externals variables. *Indonesian Interdisciplinary Journal of Sharia Economics* 5(1), 235-251.
- 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.
- Solihati, G. P., 2020. Analysis of factors affecting banking profitability. *International Journal of Management Studies and Social Science Research* 2(6), 36-48.
- Spaseska, T. H. I., and O. Dragica, 2022. The impact of capital adequacy ratio on banks' profitability in the republic of north Macedonia. *Annals of the Constantin Brancuși University of Târgu Jiu, Economy Series* 3(1), 15-37.
- 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.
- Susantih, S., and H. Ompusunggu, 2022. Analysis of loan-to-deposit ratio and nonperforming loan on profitability on profitability PT BPR Dana Nagoya. *Journal of Business, Social Sciences and Technology* 2(1), 37-49.
- 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.
- Vodova, P., 2016. Bank liquidity and profitability in the polish banking sector. *Scientific Journal of Bielsko-Biala School of Finance and Law* 20(1), 19-33.
- Vong, P. I., and H. S. Chan, 2009. Determinants of bank profitability in Macao. *Macau Monetary Research Bulletin* 12(6), 93-113.
- Witjaksono, A., and J. K. P. Natakusumah, 2020. Analysis of the effect of third-party funds, capital adequacy ratio, non-performing financing, operational expenses and operational income on the profitability of Sharia banks. *Advances in Social Science, Education and Humanities Research* 585(12), 285-291.

Chapter 5

Effect of Intangible Assets on the Profitability of Nepalese Commercial Banks

Sewak Khadka*

Abstract

This study examines the effect of intangible assets on the profitability of Nepalese commercial banks. The dependent variables selected for the study are return on assets and return on equity. The selected independent variables are capital adequacy, intangible assets, total loans, non-performing loan, total assets, and total deposit. The study is based on secondary data of 11 commercial banks with 110 observations for the study period from 2013/14 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, publications and websites of 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 intangible assets on profitability of Nepalese commercial banks.

The study showed that intangible assets have a negative impact on return on assets and return on equity. It indicates that increase in intangible assets lead to decrease in return on assets and return on equity. Similarly, total loans have a negative impact on return on assets and return on equity. It indicates that increase in total loans lead to decrease in return on assets and return on equity. Likewise, total deposit has a negative impact on return on assets and return on equity. It indicates that increase in total deposit leads to decrease in return on assets and return on equity. Further, total assets have a positive impact on return on assets and return on equity. It indicates that increase in total assets lead to increase in return on assets and return on equity. In addition, 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. Moreover, 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.

Keywords: capital adequacy, total loans, intangible assets, non-performing loan, total assets, total deposit, return on assets, return on equity

1. Introduction

Intangible assets are crucial for banks as they directly impact their ability to generate revenue, manage risks, innovate, and maintain competitive advantage. Relationships with other financial institutions, technology firms, and service providers can enhance a bank's service offerings, market reach, and operational efficiency. A strong brand and positive reputation enhance customer trust and loyalty, crucial in the financial industry where trust is paramount. Banks with reputable brands can attract and retain customers more easily, leading to higher market share and profitability. In order to create a sound and healthy financial system, wise and efficient regulation is important. Currently, the banking industry as an intermediary institution is the industry that has experienced the most rapid development, both in terms of business volume, mobilization of public funds and lending. Profitability is defined as an ability to make profit from all the business activities of an enterprise (Owolabi and Obida, 2012). Bank profitability is an important ingredient of financial development, its relevance spans through banking firm performance to macroeconomic stability. The economic development and financial growth of a country is critically dependent on the financial performance and strength of its banking sector (Shukla, 2015). The growth and financial stability of the country depends on the

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

financial soundness of its banking sector. Sound financial health of the banks is the guarantee not only to their depositors but is equally significant for the shareholders, employees, and the economy as a whole (Mohiuddin, 2014). At the firm level, a higher return to a large extent reduces bank fragility. At the macro level, increased profitability makes for a sustainable banking sector that can finance economic growth and development (Osuagwu, 2014). More precisely, it is a mirror image of quality of a bank's management and the shareholders behavior as well as the banks risk management capabilities. The health of the financial sector is a major concern of policy, especially in developing economies where failure in financial intermediation can disturb the economic growth and retards the development processes (Das and Ghosh, 2013).

The risk is primarily to the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs. The loss may be complete or partial and can arise in a number of circumstances (Muriithi, 2016). Tangible assets are traditionally a regular form of material and physical assets investments and also common financial statement positions. However, over the past decades, intangible assets have become increasingly important for knowledge creation, innovation, company's competitive advantage (Kramer *et al.*, 2011; Bagna *et al.*, 2021). Banks play a leading role in the financial systems of emerging countries by providing monetary payments at lower costs, mobilizing and allocating funds in the most efficient way and improving the saving and investment that are important for sustainable economic growth (Djalilov and Ngoc Lam, 2019). Financial intermediaries such as banks play a very important role in the operation of every economy and even though their relative importance varies substantially in different economies and different time periods, banks are essential for the performance of every modern economy (Bucevska and Hadzi, 2017). According to Aluko and Ajayi (2018), the banking sector is a pivotal segment in many countries so there is a need for continuous implementation of adequate policy measures and reforms in order to ensure that the banking sector performs its function efficiently. Banks contribute to overall economy and development (Somoye, 2008).

Garanina and Pavlova (2011) found that intangible assets have a positive relationship with the performance of a company. Similarly, Srinivasan and Hanssens (2009) showed that like traditional investment, investment in intangible assets have a positive consequence for various performance results, including a firm's market position, financial position, and firm value in the stock market. Therefore, it is necessary to introduce a paradigm to measure them and establish a link between intangible assets and firm performance. Likewise, Qureshi and Siddiqui (2020) investigated the effect of intangible assets on financial performance, financial policies, and market value of technology firms in 14 different countries. The study concluded that intangible assets have a significant negative influence on Return on Equity (ROE) and Return on Assets (ROA). Further, Bunget *et al.* (2014) examined the empirical study of intangible assets in Romanian municipalities. The study indicated that performance of public sector measured through disclosure index is greater in larger municipalities and the municipalities with the largest value of intangible assets. In addition, Sardo and Serrasqueiro (2018) investigated the intellectual capital, growth opportunities, and financial performance in European firms. The study used panel data of a dynamic model based on a sample of non-financial listed companies in 14 Western European countries for the period between 2004 and 2015. The result showed a positive effect on the relationship between growth opportunities and companies' financial performance with impact of intellectual capital. The study also showed that there is a non-linear relationship between growth opportunities and companies' financial performance and between ownership concentration and companies' growth opportunities. Similarly, Chinoda (2014) investigated the determinants of commercial bank profitability in Zimbabwe. The study concluded that book value per share, total deposit ratio and NPL are positively related to return on assets and return on equity.

Smirlock (1985) found a negative and significant relationship between debt per equity and

profitability in Islamic banks. Further, Nuhui *et al.* (2017) found that market capitalization and non-performing loans have a positive relationship with return on assets and return on equity. The study also revealed that capital adequacy ratio is positively related to return on assets but negatively related to return on equity. In addition, Serwadda (2018) revealed that capital adequacy ratio has a positive relationship with profitability measured by return on assets. The study also found that non-performing loan has a negative relationship with return on assets. Further, Al-Sharkas and Al-Sharkas (2022) examined the potential impact of capital adequacy ratios on bank profitability in a Jordanian context by using static panel data for a sample of 24 banks covering the period 2008-2018. The study found that return on assets is negatively correlated with capital adequacy ratios. Similarly, Spaseska *et al.* (2022) found that there is a positive relationship, yet statistically insignificant relationship between the capital adequacy ratio (CAR) and the return on average assets (ROA) of the Macedonian banks, both in the short- and long-run. Likewise, Torbira and Zaagha (2016) investigated the impact of capital adequacy indicators on bank financial performance measures in Nigeria. The study concluded that there is a significant long run relationship between bank financial performance variables and capital adequacy indicators in the Nigerian banking industry. In addition, Oudat and Ali (2020) examined the effect of bad debt, market capitalization, operation cost, capital adequacy, cash reserves on financial performance. The study found that market capitalization has an insignificant relationship with financial performance.

Haddawee and Flayyih (2020) examined the relation between bank deposits and profitability generated in all kind of commercial banks and to determine the types of deposits that have greater impact on the bank's profitability. Similarly, Le Quang *et al.* (2023) evaluated the factors affecting the level of customer deposits in Vietnamese commercial banks. The results showed that bank profitability, loan quality, listing status, and state-controlled ownership have a positive impact on the level of customer deposits, while bank liquidity, average interest rate, and global financial crisis negatively affect the level of customer deposits. Likewise, Ahmad *et al.* (2014) assessed the impact of loan loss provision on bank profitability in Pakistan. The study revealed that loan loss provision and profitability have negative relation with profitability of banks. Further, Alhadab and Alshawneh (2016) examined the impact of loan loss provision on the profitability of Jordanian commercial banks. The study revealed that loan loss provision has a negative impact on the profitability of Jordanian commercial banks. In addition, Uzomba *et al.* (2014) examined the impact of deposit money banks' loans and advances granted to agricultural sector in Nigerian sector. The study concluded that deposit money banks' loans and advances have positive impact on agricultural sector of Nigerian within the period of review. Similarly, Ozurumba (2016) analyzed the impact of non-performing loans on the performance of selected commercial banks in Nigeria. The study found that return on asset and return on equity have an inverse relationship with non-performing loans. Likewise, Hallunovi and Berdo (2018) revealed that capital adequacy has a positive relationship with return on assets and return on equity. Further, Thyovani and Manda (2022) found that capital adequacy ratio has a positive and significant effect on returns on assets.

In the context of Nepal, Gnawali (2018) examined the impact of non-performing loan on profitability of Nepalese commercial banks. The result showed that higher the portion of non-performing loan and bank size lower would be the profitability of the Nepalese government banks. Similarly, 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. Likewise, Singh *et al.* (2021) analyzed the effect of Non-Performing Loan (NPL) of Nepalese conventional banks. The result showed that bank size, GDP, and inflation have a significant impact on NPL but CAR does not have a significant impact on NPL of banks. Further, Shrestha (2022) analyzed the effect of credit risk

on profitability of Nepalese commercial banks. The study concluded that total loan to total deposit has a significant and positive impact on profitability. In addition, Gautam (2020) showed that capital adequacy has a significant positive impact on return on assets. Moreover, Chhetri (2021) investigated the effect of credit risk management on financial performance of commercial banks in Nepal. The study revealed that capital adequacy ratio and bank size have negative and statistically no significant impact on the financial performance but credit to deposit ratio has positive and no significant relationship with the financial performance.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of intangible assets 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 effect of intangible assets on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, total loans, intangible assets, non-performing loan, total assets, and total deposit 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 11 Nepalese commercial banks from 2013/14 to 2022/23, leading to a total of 110 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	NIC Asia Bank Limited	2013/14-2022/23	10
4	Machhapuchchhre Bank Limited	2013/14-2022/23	10
5	Himalayan Bank Limited	2013/14-2022/23	10
6	Nepal Bank Limited	2013/14-2022/23	10
7	Nepal SBI Bank Limited	2013/14-2022/23	10
8	Prime Commercial Bank Limited	2013/14-2022/23	10
9	Standard Chartered Nepal Bank Limited	2013/14-2022/23	10
10	Siddhartha Bank Limited	2013/14-2022/23	10
11	Sanima Bank Limited	2013/14-2022/23	10
Total number of observations			110

Thus, the study is based on 110 observations.

The model

The model used in this study assumes that profitability depends upon intangible assets. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are capital adequacy, intangible assets, total loans, non-performing loan, total assets, and total deposit. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 IA + \beta_2 TD + \beta_3 CAR + \beta_4 TA + \beta_5 TL + \beta_6 NPL + e_{it}$$

$$ROE = \beta_0 + \beta_1 IA + \beta_2 TD + \beta_3 CAR + \beta_4 TA + \beta_5 TL + \beta_6 NPL + e_{it}$$

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 shareholder's equity, in percentage.

IA = Intangible assets as measured by goodwill, patent and intellectual property, Rs. in million.

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.

TA = Total assets as measured by the total assets of the banks, Rs. in billion.

TL = Total loans as measured by the total loan and advance of the bank, Rs. in billion.

TD = Total deposit as measured by total amount deposit by customer, Rs. in billion.

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

Capital adequacy ratio

Capital adequacy ratio is measured as the summation of primary and supplementary capital divided by risk weighted assets. Kumar *et al.* (2020) investigated the relationship between monetary policy and bank profitability in New Zealand. The study revealed that capital adequacy ratio is positively related to return on assets. Similarly, Agbeja *et al.* (2015) found that there is a significant and positive relationship between capital adequacy ratio and bank's profitability. Likewise, Silaban (2017) concluded that capital adequacy ratio has a positive and insignificant impact on return on assets. Furthermore, Hallunovi and Berdo (2018) revealed that capital adequacy has a positive relationship with return on assets and return on equity. Further, Thyovani and Manda (2022) found that capital adequacy ratio has a positive and significant effect on returns on assets. In contrast, Al-Sharkas and Al-Sharkas (2022) concluded that capital adequacy ratios has a negative impact on return on assets. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and profitability of banks.

Intangible assets

An intangible asset is an asset that is not physical in nature, such as a patent, brand, trademark, or copyright. Businesses can create or acquire intangible assets. An intangible asset can be considered indefinite (a brand name, for example) or definite, like a legal agreement or contract. Gamayuni (2015) found that intangible assets have a positive and significant influenced to financial performance (ROA) and firm value. Likewise, Mohanlingam *et al.* (2021) found that intangible assets have a significant positive relationship with profitability measured by return on equity. Further, Ajewole *et al.* (2023)

showed that intangible assets have a positive impact on financial performance. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between intangible assets and profitability of banks.

Total deposit

Gul *et al.* (2011) showed that assets growth and total deposit have positive relationship with bank profitability in Pakistan. Similarly, Ozgur and Gorus (2016) examined the determinants of deposit bank profitability in Turkey. The study found a positive relationship of capital ratio, total assets and total deposit with bank profitability. Further, Haddawee and Flayyih (2020) found that there is a significant relation between deposits and the indicators of profitability. Likewise, Rokhmat *et al.* (2023) concluded that total deposit has a significant impact on profitability. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between total deposit and profitability of banks.

Non-performing loan

Non-performing loan is measured as the percentage of non-performing loans to total loans. The level of a credit crunch is usually proxies by the ratio of bank's non - performing loans (NPL). Kadioglu and Ocal (2017) investigated whether non-performing loans affect the bank's profitability in Turkey. The study found that non-performing loan has a negative relationship with return on asset and return on equity. Similarly, Vinh (2017) concluded that the non-performing loan has a statistically significant negative effect on banks profitability. Likewise, Kingu *et al.* (2018) found that non-performing loan has a negative and significant impact on return on assets. Furthermore, Alshebmi *et al.* (2020) revealed that non-performing loans have a negative and weak relationship with ROA. Moreover, Uddin (2022) found that the non-performing loan has a statistically significant and negative effect on commercial banks profitability. In contrast, Afriyie and Akotey (2012) found a positive relationship between non-performing loans and bank profitability. Based on it, this study develops the following hypothesis:

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

Total assets

Bourke (1989) found that there is a positive relationship of total assets with ROA (profitability), where total assets indicate the size of the bank. Similarly, Redmond *et al.* (2007) found that there is a positive significant relationship between profitability and the volume of assets. Likewise, Das (2003) revealed that there is a positive relationship between size (total assets) and profitability ratios. Further, Alkassim (2005) showed that the total asset is positively correlated to the profitability of Jordanian commercial banks. Likewise, Haron (2004) found that size (total assets) is positively correlated to the profitability measured by ROA. In addition, Smirlock (1985) revealed that size (total assets) has a positive relationship with firm profitability. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between total assets and profitability of banks.

Loan and advance

Burki and Niazi (2006) revealed that size of bank, loan and advance and interest income to earning asset ratio has positive significant relationship with the performance of banking sector. Likewise, Kolapo *et al.* (2012) found that loans and innovations have been found to have significant effect on profitability. Further, Boahene *et al.* (2012) revealed that non-performing loans rate, net charge off rate and the pre provision profit as a percentage of net total loans and advances have a positively significant association with bank profitability. In addition, Marshal and Onyekachi (2014)

found that there is a positive relationship between ratio of non-performing loans to loan and advances and banks performance. Moreover, Nwanna and Oguezie (2017) found that loan loss provision and loans and advances have positive and non-significant effect on profitability. Similarly, Shanko *et al.* (2019) revealed that loan and advance have statistically significant and positive relationship with banks' profitability. Likewise, Afolabi *et al.* (2020) revealed a significant and positive relationship between total loans and advances and returns on assets. Further, Goet (2021) revealed that there is a positive correlation of total deposit with loan and advances. Based on it, the study develops the following hypothesis:

H₆: There is a positive relationship between loan and advance 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 2013/14 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 of 2013/14 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 profit to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to risk weighted exposure, in percentage), IA (Intangible assets as measured by goodwill, patent and intellectual property, Rs. in million), TA (Total assets as measured by the total assets of the banks, Rs. in billion), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), TD (Total deposit as measured by the total deposit of the banks, Rs. in billion), and TL (Total loans as measured by the total loan and advance of the bank, Rs. in billion).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.12	1.59	0.52
ROE	3.78	28.4	15.23	4.51
IA	0.45	995.4	96.88	141.41
TL	13.34	261.8	91.03	53.19
TD	11.36	311.4	105.07	62.38
TA	0.21	364.1	136.67	76.47
NPL	0.01	5.8	1.29	1.39
CAR	4.55	23.0	13.81	2.64

Source: SPSS version 22

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 11 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 income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to risk weighted exposure, in percentage), IA (Intangible assets as measured by goodwill, patent and intellectual property, Rs. in

million), TA (Total assets as measured by the total assets of the banks, Rs. in billion), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), TD (Total deposit as measured by the total deposit of the banks, Rs. in billion), and TL (Total loans as measured by the total loan and advance of the bank, Rs. in billion).

Variables	ROA	ROE	IA	TL	TD	TA	NPL	CAR
ROA	1							
ROE	0.488**	1						
IA	-0.329	-0.219	1					
TL	-0.449**	-0.422**	0.472**	1				
TD	-0.368**	-0.375**	0.416**	0.888**	1			
TA	0.378**	0.420**	0.441**	0.950**	0.884**	1		
NPL	-0.037	-0.258**	0.434**	0.009	0.118	0.096	1	
CAR	0.389**	0.143	-0.053	0.033	0.045	-0.090	-0.050	1

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

Table 3 shows that intangible assets have a negative relationship with return on assets. It indicates that increase in intangible assets lead to decrease in return on assets. Similarly, total loans have a negative relationship with return on assets. It indicates that increase in total loans lead to decrease in return on assets. Likewise, total deposit has a negative relationship with return on assets. It indicates that increase in total deposit leads to decrease in return on assets. Further, total assets has a positive relationship with return on assets. It indicates that increase in total assets lead to increase in return on assets. In addition, 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. Moreover, 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.

Similarly, the result also shows that intangible assets have a negative relationship with return on equity. It indicates that increase in intangible assets lead to decrease in return on equity. Similarly, total loans have a negative relationship with return on equity. It indicates that increase in total loans lead to decrease in return on equity. Likewise, total deposit has a negative relationship with return on equity. It indicates that increase in total deposit leads to decrease in return on equity. Further, total assets has a positive relationship with return on equity. It indicates that increase in total assets lead to increase in return on equity. In addition, 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. Moreover, 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.

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, total loans, intangible assets, non-performing loan, total assets, and total deposit on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, intangible assets, non-performing loan, total assets, total loans and total deposit on return on assets

The results are based on panel data of 11 commercial banks with 110 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 IA + \beta_2 TD + \beta_3 CAR + \beta_4 TA + \beta_5 TL + \beta_6 NPL + e$, 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 risk weighted exposure, in percentage), IA

(Intangible assets as measured by goodwill, patent and intellectual property, Rs. in million), TA (Total assets as measured by the total assets of the banks, Rs. in billion), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), TD (Total deposit as measured by the total deposit of the banks, Rs. in billion), and TL (Total loans as measured by the total loan and advance of the bank, Rs. in billion).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		IA	TL	TD	TA	NPL	CAR			
1	1.613 (23.732)**	-0.001 (2.918)**						0.095	0.474	8.514
2	1.991 (22.415)**		-0.004 (5.229)**					0.195	0.468	27.343
3	1.913 (20.945)**			-0.003 (4.118)**				0.128	0.487	16.959
4	1.942 (20.411)**				0.003 (4.241)**			0.135	0.485	17.979
5	1.575 (22.844)**					-0.011 (0.315)		0.008	0.524	0.099
6	0.527 (2.138)**						0.077 (4.391)**	0.144	0.483	19.271
7	2.109 (15.909)**	-0.230 (8.761)**	-0.005 (4.213)**					0.271	0.426	14.151
8	2.112 (15.832)**	-0.205 (0.882)	-0.006 (2.763)**	-0.001 (0.515)				0.262	0.428	9.422
9	2.104 (15.726)**	-0.278 (0.872)	-0.008 (2.486)*	-0.001 (0.369)	0.002 (0.946)			0.261	0.429	7.279
10	2.027 (14.357)**	-0.001 (1.462)	-0.071 (0.964)	-0.219 (0.124)	0.001 (0.592)	-0.076 (1.573)		0.277	0.424	6.446
11	1.209 (3.181)**	-0.205 (0.961)	-0.007 (2.091)*	-0.001 (0.337)	0.001 (0.556)	-0.062 (0.512)	0.062 (2.306)*	0.322	0.411	6.611

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 asset is the dependent variable.

Table 4 shows that the beta coefficients for the intangible assets are negative with return on assets. It indicates that intangible assets have a negative impact on return on assets. This finding is similar to the findings of Ajewole *et al.* (2023). Similarly, the beta coefficients for total loans are negative with return on assets. It indicates that total loans have a negative impact on return on assets. This finding is not consistent with the findings of Nwanna and Oguezie (2017). Likewise, the beta coefficients for total deposit are negative with return on assets. It indicates that total deposit has a negative impact on return on assets. This finding contradicts with the findings of Bourke (1989). Further, 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 not similar to the findings of Vinh (2017). In addition, the beta coefficients for total assets are positive with return on assets. It indicates that total assets have a positive impact on return on assets. This finding is not similar to the findings of Alkassim (2005). Moreover, 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 Kumar *et al.* (2020).

Table 5 shows the regression results of capital adequacy ratio, total loans, intangible assets, non-performing loan, total assets, and total deposit on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, intangible assets, non-performing loan, total assets, total loans, and total deposit on return on equity

The results are based on panel data of 11 commercial banks with 110 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 IA + \beta_2 TD + \beta_3 CAR + \beta_4 TA + \beta_5 TL + \beta_6 NPL + e$, 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 risk weighted exposure, in percentage), IA (Intangible assets as measured by goodwill, patent and intellectual property, Rs. in million), TA (Total assets as measured by the

total assets of the banks, Rs. in billion), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), TD (Total deposit as measured by the total deposit of the banks, Rs. in billion), and TL (Total loans as measured by the total loan and advance of the bank, Rs. in billion).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		IA	TL	TD	TA	NPL	CAR			
1	14.471 (24.867)**	-0.006 (1.879)						0.034	4.064	3.530
2	18.485 (23.731)**		-0.036 (0.4836)					0.017	4.107	23.384
3	18.077 (22.968)**			-0.027 (0.375)				0.133	4.200	17.667
4	18.611 (23.093)**				0.025 (4.803)**			0.168	4.112	23.067
5	16.413 (28.676)**					-0.905 (3.004)**		0.069	4.352	9.024
6	18.598 (8.131)**						0.244 (1.499)	0.011	4.484	2.247
7	16.147 (12.898)**	-0.004 (0.959)	-0.017 (1.509)					0.052	4.027	2.936
8	16.098 (12.827)**	-0.004 (0.939)	-0.002 (0.121)	-0.013 (0.891)				0.049	4.033	2.216
9	16.205 (12.959)**	-0.004 (0.956)	-0.031 (0.963)	-0.01 (0.689)	0.025 (1.331)			0.06	4.011	2.123
10	18.052 (15.372)**	-0.003 (0.907)	-0.007 (0.231)	-0.001 (0.027)	0.008 (0.488)	-1.813 (4.519)**		0.271	3.531	6.275
11	17.43 (5.302)**	-0.004 (0.923)	-0.007 (0.235)	-0.001 (0.051)	0.008 (0.489)	-1.851 (4.161)**	0.047 (0.203)	0.260	3.557	5.161

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 intangible assets are negative with return on equity. It indicates that intangible assets have a negative impact on return on equity. This finding is similar to the findings of Ajewole *et al.* (2023). Similarly, the beta coefficients for total loans are negative with return on equity. It indicates that total loans have a negative impact on return on equity. This finding is not consistent with the findings of Kolapo *et al.* (2012). Likewise, the beta coefficients for total deposit are negative with return on equity. It indicates that total deposit has a negative impact on return on equity. This finding contradicts with the findings of Gul *et al.* (2011). Further, 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 Alshebmi *et al.* (2020). In addition, the beta coefficients for total assets are positive with return on equity. It indicates that total assets have a positive impact on return on equity. This finding is similar to the findings of Alkassim (2005). Moreover, 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 not similar to the findings of Hallunovi and Berdo (2018).

4. Summary and conclusion

Banking sector is highly regulated by the government. To carry out banking regulation effectively, government employs monetary policies as the primary tool to regulate the banking sector. Being an external factor to the banks, the tools could act as a militating or mitigating factor in boosting banks profitability. The way and manner these factors are applied to banks vary from one country to the other and has traceable relationship to the state of the particular country's economy. Capital adequacy provides protection against adverse shocks and increases the likelihood of higher earnings. In stable economies, these tools are spared of frequent manipulations and vice versa. Intangible assets are non-physical assets that have value to a company but lack a physical presence. They are long-

term resources that typically contribute to a company's revenue generation capabilities over time. Investments in various forms of tangible assets are well-known contributors to shareholder wealth and company growth. For the commercial bank the intangible assets can be goodwill, brand recognition, customer relationships, software and intellectual property.

This study attempts to analyse the effect of intangible assets on profitability of Nepalese commercial banks. The study is based on secondary data of 11 commercial banks with 110 observations for the period from 2013/14 to 2022/23.

The major conclusion of this study is that total assets and capital adequacy ratio have positive impact on return on assets and return on equity. It indicates that higher the total assets and capital adequacy ratio, higher would be the return on assets and return on equity. However, intangible assets, total loans, total deposit, and non-performing loans have negative impact on return on assets and return on equity. It indicates that higher the intangible assets, total loans, total deposit, and non-performing loans, lower would be the return on assets and return on equity. Likewise, the study also concluded that capital adequacy ratio followed by total assets is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese commercial banks.

References

- Afolabi, T. S., T. M. Obamuyi, and T. Egbetunde, 2020. Credit risk and financial performance: Evidence from microfinance banks in Nigeria. *Journal of Economics and Finance* 11(1), 8-15.
- Afriyie, H. O., and J. O. Akotey, 2013. Credit risk management and profitability of rural banks in the Brong Ahafo Region. *European Journal of Business and Management* 5(4), 24-33.
- Agbeja, O., O. J. Adelakun, and F. I. Olufemi, 2015. Capital adequacy ratio and bank profitability in Nigeria: linear approach. *International Journal of Novel Research in Marketing Management and Economics* 2(3), 91-99.
- 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.
- Ajewole, O. J., O. A. Seyingbo, O. A. Olonite, and T. A. Solomon, 2023. The nexus between tangible and intangible assets and profitability of telecommunication firms in Nigeria. *International Journal of Advance Research in Multidisciplinary* 1(1), 60-68.
- 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.
- Alkassim, F. A., 2005. The profitability of Islamic and conventional banking in the GCC countries: A comparative study. *Journal of Review of Islamic Economics* 13(1), 5- 30.
- 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.
- Aluko, O. A., and M. A. Ajayi, 2018. Determinants of banking sector development: Evidence from Sub-Saharan African countries. *Borsa Istanbul Review* 18(2), 122-139.
- Bagna, E., E. Cotta Ramusino, and S. Denicolai, 2021. Innovation through patents and intangible assets: effects on growth and profitability of European companies. *Journal of Open Innovation: Technology, Market, and Complexity* 7(4), 220.
- Boahene, S. H., J. Dasah, and S. K. Agyei, 2012. Credit risk and profitability of selected banks in Ghana. *Research Journal of Finance and Accounting* 3(7), 57-64.

- 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.
- Bucevska, V., and B. Hadzi Misheva, 2017. The determinants of profitability in the banking industry: Empirical research on selected Balkan countries. *Eastern European Economics* 55(2), 146-167.
- Bunget, O. C., R. G. Blidisel, L. Feleaga, and I. E. Popa, 2014. Empirical study of intangible assets in Romanian municipalities. *Journal of Finance* 10(3), 136-151.
- Burki, A. A., and G. S. K. Niazi, 2006. Impact of financial reforms on efficiency of state owned, private and foreign banks in Pakistan. *Applied Economics* 42(24), 3147 - 3160.
- Chhetri, G. R., 2021. Effect of credit risk management on financial performance of Nepalese commercial banks. *Journal of Balkumari College* 10(1), 19-30.
- Chinoda, T., 2014. The determinants of commercial banks profitability in Zimbabwe (2009-2014). *Journal of Economics and Finance* 5(6), 69-80.
- Das, A., 2003. Technical, a locative and scale efficiency of public sector in India, money and banking. *Economist of Research Bank of India and Academic Foundation* 1(1), 275-285.
- Das, A., and S. Ghosh, 2013. Determinants of credit risk in Indian state-owned banks: An empirical investigation. MPRA Paper, 1-21.
- Djalilov, K., and T. Ngoc Lam, 2019. Ownership, risk and efficiency in the banking sector of the ASEAN Countries. *Financial Markets, Institutions and Risks* 3(2), 5-16.
- Gamayuni, R. R., 2015. The effect of intangible asset, financial performance and financial policies on the firm value. *International Journal of scientific and technology research* 4(1), 202-212.
- 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.
- 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.
- Goet, J., 2021. Effect of determinants of lending behavior on loan and advances in joint venture commercial banks in Nepal. *The Journal of Economic Concerns* 12(1), 92-97.
- Gul, S., F. Irshad, and K. Zaman, 2011. Factors affecting bank profitability in Pakistan. *Romanian Economic Journal* 14(39), 61-87.
- 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.
- 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.
- Haron, S., 2004. Determinants of Islamic bank profitability. *Global Journal of Finance and Economics* 1(1), 11-33.
- 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.
- 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.
- Kolapo, T. F., R. Ayeni, and M. Oke, 2012. Credit risk and commercial bank's performance in Nigeria: A panel model approach. *Australian Journal of Business and Management Research* 2(2), 31-38.
- Kramer, J. P., E. Marinelli, S. Iammarino, and J. R. Diez, 2011. Intangible assets as drivers of innovation: Empirical evidence on multinational enterprises in German and UK regional systems of innovation. *Technovation* 31(9), 447-458.
- 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), 35-48.

- Le Quang, P., B. A. Thanh, and N. D. Phuong, 2023. Factors affecting the level of customer deposit: the case of commercial banks in Vietnam. *Journal of International Economics and Management* 23(1), 52-69.
- Marshal, I., and O. Onyekachi, 2014. Credit risk and performance of selected deposit money banks in Nigeria: *An empirical investigation. European Journal of Humanities and Social Sciences* 31(1), 1684-1694.
- Mohanlingam, S., L. T. P. Nguyen, and R. Mom, 2021. The effects of intangible assets on financial performance and financial policies of listed technology firms in Thailand. *Journal of Applied Economics and Business Research* 10(1), 1-17.
- Mohiuddin, G. 2014. Use of CAMEL model: A study on the financial performance of selected commercial banks in Bangladesh. *Universal Journal of Accounting and Finance* 2(5), 51-160.
- Muriithi, J. G., K. M. Waweru, W. M. Muruti, 2016. Effect of credit risk on financial performance of commercial banks in Kenya. *Journal of Economics and Finance* 7(4), 72-83.
- Nuhui, 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.
- Nwanna, I. O., and F. C. Oguezie, 2017. Effect of credit management on profitability of deposit money banks in Nigeria. *International Journal of Banking and Finance Research* 3(2), 137-160.
- Osuagwu, E., 2014. Determinants of bank profitability in Nigeria. *International Journal of Economics and Finance* 6(12), 46-63.
- Oudat, M. S., and B. J. Ali, 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), 5979-5986.
- Owolabi, S. A., and S. S. Obida, 2012. Liquidity management and corporate profitability: case study of selected manufacturing. *Business Management Dynamics* 2(2), 10-25.
- Ozgur, O., and M. S. Gorus, 2016. Determinants of deposit bank profitability: evidence from Turkey. *Journal of Applied Economics and Business Research* 6(3), 218-231.
- 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., 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.
- Qureshi, M. J., and D. A. Siddiqui, 2020. The effect of intangible assets on financial performance, financial policies, and market value of technology firms: A global comparative analysis. *Macrothink Institute: Asian Journal of Finance and Accounting* 12(1), 6-57.
- Redmond, R., G. Giradeau, and C. Bonhnsac, 2007. Bank size and profitability: One nation, one bank. *International of Business Research* 8(1), 15-55.
- Rokhmat, N., S. Zulaihati, and S. Susanti, 2023. The effect of deposits and non-performing loans on bank profitability: (case study on conventional commercial banks listed on the Indonesia stock exchange for the period 2015-2021). *Journal of Management, Accounting, General Finance and International Economic Issues* 2(2), 416-435.
- Sardo, F., and Z. Serrasqueiro, 2018. Intellectual capital, growth opportunities, and financial performance in European firms: dynamic panel data analysis. *Journal of Intellectual Capital* 19(4), 747-767.
- Serwadda, I., 2018. Determinants of commercial banks' profitability. Evidence from Hungary. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis* 66(5), 1325-1335.
- Shanko, T., M. A. Timbula, and T. Mengesha, 2019. Factors affecting profitability: an empirical study on ethiopian banking industry. *International Journal of Commerce and Finance* 5(2), 87-96.
- Shrestha, P. M., 2022. Effect of credit risk on profitability of Nepalese commercial banks. *Butwal Campus Journal* 5(1), 1-11.
- Shukla, S. S., 2015. Analysing financial strength of public and private sector banks: A CAMEL Approach. *Pacific*

Business Review International 7(8), 44-50.

- 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.
- 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 (none) relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking* 17(1), 69-83.
- Somoye, R. O. C., 2008. The performances of commercial banks in post-consolidation period in Nigeria: An empirical review. *European Journal of Economics, Finance and Administrative Sciences* 14(1), 62-73.
- Spaseska, T., I. Hristoski, and D. Odzaklieska, 2022. The impact of capital adequacy ratio on banks' profitability in the republic of north Macedonia. *Annals of the Constantin Brâncuși" University of Târgu Jiu, Economy Series* 22(1), 15-37.
- Srinivasan S., and D. M. Hanssens, 2009. Marketing and firm value: metrics, methods, findings, and future directions, *Journal of Marketing Research* 46(2), 293-312.
- Thyovani, E., and G. S. Manda, 2022. The influence of capital adequacy ratio and non-performing loan on return on assets. *Primanomics: Jurnal Ekonomi and Bisnis* 20(2), 101-112.
- Torbira, L. L., and A. S. Zaagha, 2016. Capital adequacy measures and bank financial performance in Nigeria: A cointegration analysis. *Journal of Finance and Economic Research* 3(1), 15-34.
- 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* 19(1), 224-235.
- Uzomba, P. C., S. N. Chukwu, G. A. Jumbo, and N. U. Nwankwo, 2014. An inquiring into the impact of deposit money banks' loans/advances on agricultural sector in Nigeria; 1980-2011. *International Review of Social Sciences and Humanities* 7(2), 130-139.
- 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.

Chapter 6

Effects of Banking Sectoral Factors on Profitability of Nepalese Commercial Banks

Aashiyana Karki*

Abstract

This study examines the effects of banking sectoral factors on profitability of Nepalese commercial banks. Return on assets and return on equity are the selected as dependent variables. The selected independent variables are operational efficiency, capital adequacy ratio, liquidity ratio, non-performing loans, debt to assets ratio, loan loss provision, and bank size. The study is based on secondary data of 12 commercial banks with 104 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 banking sectoral factors on the profitability of Nepalese commercial banks.

The study showed that operational efficiency has a negative effect on return on assets and return on equity. It indicates that increase in operation efficiency leads to decrease in return on assets. Similarly, capital adequacy ratio has a positive effect on return on assets. It indicates that higher the capital adequacy ratio, higher would be the return on assets. Likewise, liquidity ratio has a positive effect on return on assets and return on equity. It indicates that increase in liquidity ratio leads to increase in return on assets and return on equity. In addition, non-performing loan has a negative effect 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. Furthermore, debt to assets ratio has a negative effect on return on assets. It indicates that higher the debt to assets, lower would be the return on assets. Moreover, loan loss provision has a negative effect 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. Furthermore, bank size has a negative effect on return on assets and return on equity. It indicates that higher the bank size, lower would be the return on assets and return on equity.

Keywords: operational efficiency, capital adequacy ratio, liquidity ratio, non-performing loans, debt to assets ratio, loan loss provision, bank size, return on assets, return on equity

1. Introduction

Banks are integral to a nation's financial industry, possessing several branches and subsidiaries that operate both domestically and globally. Commercial banks are essential in the distribution of resources in several nations. To serve effectively as middlemen, commercial banks must ensure their own sustainability. The banking industry drives a nation's economy forward. A bank is an institution that collects funds from the public via deposits and allocates them as credit or through other methods. In order to give modern trade and commerce a significant source of funding, the banking industry serves as its lifeblood. The idea of efficiency has become increasingly significant for both financial and non-financial entities, of which banks are a part, as a result of the growing globalization phenomenon. The success and expansion of banks are primarily determined by their competitive marketing strategy. In comparison to earlier times, the banking industry's practices have undergone significant change in the new millennium (Bhatti and Hussain, 2010). Ensuring optimal performance is essential for banks, as it profoundly influences public trust (Safitri *et al.*, 2020).

* Ms. Karki is a Freelance Researcher, Kathmandu, Nepal.

The concept of profitability is crucial for both financial and non-financial organizations, and commercial banks are seen as the foundation of financial institutions. A substantial profitability level may signify the bank's operational efficiency. A significant degree of profitability may indicate an improvement in the bank's production and reflect the institution's overall development. Consequently, profitability is crucial for both the bank and its current and potential clients. The primary measure for assessing a company's performance has always been profitability. A bank's performance is a reflection of its financial status over a specific time period, either in connection to fund allocation or fund raising. This is typically determined by a number of metrics, including bank profitability, liquidity, and capital sufficiency. Strong bank profitability indicates a greater ability to generate income and a greater contribution to economic expansion. (Adiatmayani and Panji, 2021). Akter and Mahmud (2014) pointed that the profitability of banks is dictated by their equity reserves and growth potential, acting as an indicator of their performance. Financial institutions generate profit when their income surpasses their expenditures. Evaluating a bank's profitability requires examining its earnings per share and the efficiency with which it utilizes its assets to generate profits. Key metrics, including Return on Assets (ROA) and Return on Equity (ROE), are utilized to evaluate the profitability of the banking sector. A robust profitability position signifies a bank's capacity to generate profits and substantially contribute to a nation's economic progress.

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 profitability 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. Factors that affect firms' performance are either macro or micro factors and they have an important impact on firms' performance. Macro factors are those factors that are out the control of the company, whereas micro factors include the factors that are under the control of the company. The changes that might happened for macro-economic factors will positively or negatively affect the financial performance of a company. Similarly, if any changes occur for the micro factors, will have the same effect either positively or negatively on the firms that belongs to the same industry. There could be number of reasons for this difference in response of the firms to the same macro changes but all of these reasons are related to the micro factors of the firm (Demirhan and Anwar, 2014).

Ahmad and Ahmad (2017) stated that capital adequacy is one of the vital indicators of the financial solvency of the banking industry. The Logic behind the capital adequacy is to protect the interest of public deposit as well as safe guard the banks in their financial positions. Capital adequacy reflects the overall financial conditions of the bank and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb unexpected loss. It also acts as indicators of bank leverage. Capital Adequacy should maintain on the basis of total risk weighted assets. It tells how much capital it has relative (as the percentage of) the money it has lent out i.e. its assets. Capraru and Ihnatov (2014) showed that the bank profitability and the capital adequacy ratio are positively correlated. Capital adequate will provide a protection against the insolvency and liquidation arising from the risks that the bank is facing. The higher the CAR, the more flexible the bank is to place funds in risky productive assets (Arasy and Sri, 2020). The higher the CAR reflects the greater the capital owned by the bank so that it affects the level of public trust which leads to an increase in bank profits (Sari and Endri, 2019).

Credit risk, also known as non-performing loans, is a risk that appears whenever a borrower anticipates using future cash flows to settle an outstanding debt. The NPL is a measure of credit risk;

the larger the NPL, the more losses the bank will incur as the money it dispensed has not been recouped and could result in fewer profits and income. The possibility that a borrower would default on a loan or otherwise breach a contractual agreement, resulting in the loss of principal or a financial reward is NPL. Sushmitha and Nagaraja (2020) found that the growing number of non-performing assets is seriously disrupting the Indian banking sector's ability to conduct business. One of the primary causes of the issues with economic stagnation is non-performing loans. Bank failure is typically the result of the banking system's high number of non-performing loans. (Messai and Jouini, 2013) Non-performing loans impede bank liquidity, since increased lending can decelerate bank development during defaults, thereby affecting the national economy (Somoye, 2010). Moreover, due to their effect on the profitability of commercial banks, non-performing loans have emerged as a significant worry for financial institutions and academics.

A financial charge on the income statement allocated for anticipated defaults on loans and overdue payments is referred to as the loan loss provision. To accurately reflect their financial health, banks must consider possible loan defaults and related expenses. A valuable instrument employed to mitigate the risk of customer default on bank obligations is the loan loss provision (Alhadab and Alsahawneh, 2016). The loan loss provisioning strategy significantly influences banks' capital and profitability, hence impacting their lending capacity to the economy, making it essential for assessing the stability of the financial system (Beatty and Liao, 2009). Likewise, Brigham and Huston (2019) assert that the debt to asset ratio (DAR) quantifies the extent of debt use relative to total assets owned. Increased debt incurred for asset acquisition may result in elevated interest payments, adversely affecting the company's profit generation capacity. Budhiarjo (2024) demonstrated that financial stress is concurrently affected by the Debt to Asset Ratio (DAR) and Total Asset Turnover (TATO). Sunaryo (2021) analyzed the influence of the current ratio (CR), debt to asset ratio (DAR), and gross profit margin (GPM) on financial distress. Results demonstrated that Financial Distress was marginally influenced by the Debt to Asset Ratio (DAR), but the Current Ratio (CR) and Gross Profit Margin (GPM) had no meaningful effect.

Operational efficiency is an organization's capacity to make efficient use of its resources in order to generate goods or services with the least amount of waste, expense, and time. Kalluru and Bhat (2009) operational efficiency is the ability of a business to minimize undesirables and optimize resources in order to provide customers with high-quality products and services. Enhancing operational efficiency has a direct impact on an organization's profitability, and cost-effective enterprises are more profitable. It can also boost customer satisfaction, competitiveness, and profitability. For management to take into account sound and long-term financial performance, every aspect of operational efficiency are essential and must be earned (Sufian, 2007). Banks need to find a balance between controlling operating costs and offering clients high-quality services. Cutting costs is a good thing, but it shouldn't come at the price of the bank's ability to compete in the market or customer pleasure. The profitability of banks is therefore directly impacted by operating expenses. The financial performance and overall profitability of banks can be improved by efficient management of these costs. Shuremo (2016) found that if a bank effectively manages its operating expenses and keeps them low, it can improve its profitability.

The significance of retaining liquid assets inside the company pertains to the opportunity cost associated with generating profitability. Liquidity management serves as the foundation of the organization. Without sustaining sufficient cash within the business, managers are unable to forecast their future. If the business is unable to generate any profit, it is deemed to be in a state of distress. However, if the company lacks liquidity, it will ultimately fail and cease to exist. Liquidity is a prerequisite for assessing the company's existence. Nireesh (2012). Lartey *et al.* (2013) demonstrated

a very modest positive correlation between the profitability of listed businesses and their liquidity ratio. Saleem and Rehman (2011) demonstrated the correlation between profitability and liquidity. The results indicated that the liquid ratio significantly affects ROA, but does not influence ROE or ROI. They demonstrated that whereas ROI is considerably influenced by current ratios, quick ratios, and liquid ratios, ROE is not significantly affected by any of these three ratios. The study's principal findings highlighted that, except the liquidity ratios, each ratio (variable) significantly influences the financial conditions of enterprises with differing magnitudes. Profitability ratios greatly impact the financial conditions of enterprises.

Company size is one of the most commonly utilized criteria to characterize organizational profitability. The scale of a firm is indicated by its skills, variety, production capabilities, and the range and quantity of services or enterprises it can simultaneously offer to clients. The most effective metric for assessing a company's size is the magnitude of its management team or the overall assets it possesses relative to other firms within the same industry (Sritharan, 2015). According to Nireesh and Velnampy (2014), the conventional neoclassical perspective of a corporation include the notion of economies of scale, positioning a firm's size as a significant factor in its profitability. In the contemporary landscape, the scale of a corporation is crucial, as larger enterprises can produce things at much reduced costs compared to their smaller counterparts. Likewise, by enabling banks to take advantage of economies of scale, larger banks can become more profitable. For instance, banks can lower their average expenses by spreading fixed costs over a larger asset base as they grow in size. By diversifying activities across product lines, industries, and geographical areas, banks can lower risk by increasing their asset size. (Mester, 2010)

In the context of Nepal, Pradhan and Shrestha (2016) examined the impact of bank operational efficiency and capital adequacy on the financial performance of commercial banks in Nepal. The research findings reveal that the key determinants affecting the financial performance of commercial banks in Nepal are the total deposits to total assets ratio and the institutions' operational efficiency. The financial performance of commercial banks is significantly improved by parameters like loan ratio, total deposits to total assets, loan loss provisions to total equity, and operational efficiency. The ratio of loan loss provisions to total loans, core capital, risk-weighted assets, and total capital adversely impacts the financial performance of commercial banks in Nepal. Gurung and Gurung (2022) observed the various aspects shaping commercial bank profitability in Nepal. The study revealed that non-performing assets weakly influence the return on assets, but it has a significant negative effect on the equity return. Similarly, Acharya and Vyas (2022) analyzed the impact of bank-specific and macroeconomic variables on the profitability of Nepalese commercial banks. The study revealed that CAR, NPL have negative and statistically significant impact on the profitability of banks measured by ROA and ROE. Gnawali (2018) found that there is a negative impact of non-performing loan on return on assets in context of Nepalese government banks. Tharu and Shrestha (2019) examined the impact of bank size on the profitability of commercial banks in Nepal. The research found that the bank's size (assets) did not significantly affect profitability (ROA).

The above discussion reveals that the empirical evidences vary greatly across the studies on the effects of banking sectoral factors 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 effects of sectoral factors on the profitability of Nepalese commercial banks. Specifically, it examines the effect of operational efficiency, capital adequacy ratio, liquidity, non-performing loans, debt to assets, loan loss provision, and bank size 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 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 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 the banks	Study period	Observation
Public banks			
1	Nepal Bank Limited	2014/15-2022/23	9
2	Rastriye banijye bank	2014/15-2022/23	9
Joint venture banks			
3	Himalayan Bank Limited	2014/15-2022/23	9
4	Everest Bank Limited	2014/15-2022/23	9
5	NMB Bank Limited	2014/15-2022/23	9
	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
Private banks			
6	Nepal SBI Bank Limited	2014/15-2022/23	9
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 International Bank Limited	2014/15-2022/23	9
12	Nepal SBI Bank Limited	2014/15-2022/23	9
Total number of observations			108

Source: Annual reports

Thus, the study is based on 108 observations.

The model

The model used in this study assumes that profitability of banks depends upon banking sectoral factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are operational efficiency, capital adequacy ratio, liquidity, non-performing loans, debt to assets, loan loss provision, and bank size. Therefore, the models

take the following forms:

$$ROA = \beta_0 + \beta_1 OE + \beta_2 CAR + \beta_3 LR + \beta_4 NPL + \beta_5 DAR + \beta_6 LLP + \beta_7 BS + e_{it}$$

$$ROE = \beta_0 + \beta_1 OE + \beta_2 CAR + \beta_3 LR + \beta_4 NPL + \beta_5 DAR + \beta_6 LLP + \beta_7 BS + e_{it}$$

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.

OE = Operational 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.

LR = Liquidity ratio as measured by the ratio of cash & other liquid assets to short term borrowings and current liabilities, in percentage.

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

DAR = Debt to asset ratio as measured by the ratio of total liabilities to total assets, in percentage.

BS= Bank size as measured by total assets, Rs. in billion.

LLP = Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage.

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

Operational efficiency

Operational efficiency is a measure of how successfully a bank controls its spending in relation to its income. It is commonly obtained using measures like the cost-to-income ratio or efficiency ratio. A bank may maximize revenue and minimize expenses when it runs profitably, increasing profitability (Boateng, 2019). Buchory (2015) found a positive relationship between operational efficiency and banks' profitability. According to Halkos and Salamouris (2004), other things being equal, a reduction in the efficiency ratio is a good sign, whereas a growing efficiency ratio is often bad. Bashir (2003) demonstrated that operational efficiency and bank profitability have a positive connection, which is consistent with the efficiency wage theory. Moreover, Sufian (2011) examined how bank characteristics affected the profitability of banks in the Korean banking sector. The study discovered that the profitability of the Korean banking sector is positively impacted by operating efficiency. Likewise, Masood (2012) discovered a strong correlation between operating efficiency and return on equity (ROE). Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between operational efficiency ratio and banks' profitability.

Capital adequacy ratio (CAR)

The capital adequacy ratio (CAR) measures the capital ability to indicate the degree of risk associated with bank assets. Additionally, the capital itself carries some risk because the bank got it from non-bank sources Kusumastuti & Alam (2019). Olalekan, & Adeyinka (2013) revealed a strong and positive correlation between bank profitability and capital adequacy. Similarly, Almumani

(2013) demonstrated a favorable correlation between Jordanian banks' profitability and their capital adequacy ratio. Likewise, Widyastuti *et al.* (2017) discovered that profitability is positively impacted by the capital adequacy ratio. In addition, Alzoubi (2018) concluded that the capital adequacy ratio and bank profitability, as determined by return on assets, were positively correlated. Similarly, Nahar *et al.* (2020) identified a positive relationship between capital adequacy ratio and profitability. Mbaeri *et al.* (2021) discovered a positive correlation between profitability as measured by return on equity and the capital adequacy ratio. However, Sayani *et al.* (2017) discovered that the capital adequacy ratio and profitability are negatively correlated. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between capital adequacy ratio and banks' profitability.

Liquidity ratio

Liquidity refers to the ability to meet cash demands, either through continual cash flow or asset sales at fair market value. Ibrahim (2017) bank liquidity may have an effect on profitability, and numerous studies have discovered a positive correlation between liquidity and profitability. The study discovered that any rise in liquidity ratios will cause ROA to rise. Rehman *et al.* (2015) discovered that, during the period of 2008–2012, the ROA of 99 Saudi companies that are listed benefits from having a high current liquidity ratio where ROA is positively impacted by liquidity. However, Ongore, & Kusa (2013) discovered that the liquidity ratio had no significant impact on banks' performance. Additionally, Lartey *et al.* (2013) showed that the profitability of Ghana's listed banks and their liquidity had a very weak positive correlation. According to the study, liquid ratio has a significant impact on ROA (Saleem & Rehman, 2011).

H₃: There is a positive relationship between liquidity ratio and banks' profitability

Non-performing loans (NPL)

The ratio of non-performing loans to total loans is used to calculate non-performing loan amounts. The ratio of bank non-performing loans typically indicates the severity of the credit crunch. (Alexandri and Santoso, 2015). Islam and Rana (2017) demonstrated a significant negative association between non-performing loans and Bangladeshi banks' profitability as determined by return on equity. Similarly, improved financial institution performance contributes significantly to a nation's economic growth. According to Kaaya and Pastory (2013), the ratio of non-performing loans has a negative effect on Kenya's commercial banks' profitability. Likewise, Akter and Roy (2017) claimed that non-performing loans have a statistically significant negative influence on return on assets and are the main factor determining banks' profitability. The non-performing loans ratio and the rates of return on equity and return on assets shows strong negative association. Regression study demonstrates that when the percentage of nonperforming loans rises, bank profitability declines (Jolevski (2017). Based on it, this study develops the following hypothesis:

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

Debt-to-asset ratio (DAR)

Yuan *et al.* (2022) found to be positive and significant relationship with Debt to Asset Ratio (DAR) and profitability. The study demonstrated a positive relationship between DAR and profitability, with DAR having an important part in the profitability of commercial banks in Ethiopia. Bagh *et al.* (2017) showed debt to asset ratio (DAR) have a significant and positive impact on ROA. Ebenezer & Omar (2016) examined the impact of credit risk on the profitability of commercial banks in Nigeria. There is a negative and insignificant correlation between debt to total assets ratio and profitability.

Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between debt to asset ratio and banks' profitability.

Loan loss provision (LLP)

Loan loss provision indicates a bank's ability to withstand potential loan losses. Loan loss provision reduces the bank's profitability and stability. Loan loss provisions are used as a cushion to adjust for the predicted loss caused by missed installment payments on a bank's loan portfolio; they are also known as bad debt provisions (Ozili and Outa, 2017). Iloska (2014) found that loan-loss provisions have a negative impact on bank profitability. Sufian and Habibullah (2009) discovered that loan loss provision and profitability are negatively associated. Pelealu and Worang (2017) discovered that loan loss provisions have a negative and small impact on bank profitability. Likewise, Alhadab and Alsahawneh (2016) discovered that loan loss provisions have a negative impact on the profitability of Jordanian commercial banks. Similarly, loan loss provision is shown to have a negative and significant association with profitability (Ramlall, 2009). However, Fernando and Ekanayake (2015) discovered a positive link between loan loss provision and profit before tax. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between loan loss provision and banks' profitability.

Bank size (BSIZE)

The total of all investments, net current assets, total intangibles, net fixed assets, and other assets is known as total assets. Sufian *et al.* (2009) evaluates if a company's size and performance are related. The study showed that company size has a positive impact on performance. The study came to the conclusion that because of the economies of scale that come with size, large enterprises may raise money more cheaply. Islam *et al.* (2021) the size of the bank has a positive impact on profitability. San and Heng (2013) showed that bank size and profitability, as measured by return on equity, are positively correlated. Likewise, Regehr *et al.* (2016) found bank size (BS) has a positive impact on banks profitability. Lardic and Terraza (2019) discovered a positive and significant correlation between profitability and medium-sized banks. Furthermore, Smirlock (1985) proposed that size is positively connected to bank profitability. Domanovic *et al.* (2018) discovered a favorable correlation between bank size and Serbian bank profitability. Kassem and Sakr (2018) studied the association between bank-specific characteristics and bank profitability in Egypt. The study found a positive relationship between bank size and profitability as evaluated by return on assets and return on equity. However, Akbas (2012) showed that bank size has a negative relationship with profitability, as assessed by return on assets and return on equity. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between bank size and banks' 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 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 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 OE (operational efficiency ratio 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), LR (liquidity ratio as measured by cash and other liquid assets to short term borrowing and current liabilities, in percentage), NPL (non-performing loan as measured by ratio of nonperforming loans to total loans, in percentage), DAR (debt to asset ratio as measured by ratio of total liabilities to total asset, in percentage), LLP (loan loss provision as measured by ratio of loan loss provision to total loans, in percentage), BSIZE(bank size , Rs. In billions)

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.22	1.56	0.48
ROE	3.78	69.56	15.14	6.95
OE	20.35	78.37	42.30	9.54
CAR	7.49	22.99	13.61	2.20
LR	2.89	35.07	18.05	9.36
NPL	0.01	4.85	1.39	1.27
DAR	72.11	99.67	88.96	2.99
LLP	0.10	7.38	1.60	1.30
BSIZE	4.03	39.40	14.63	7.41

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 ROA (Return on assets as measured by 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 OE (operational efficiency ratio 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), LR (liquidity ratio as measured by cash and other liquid assets to short term borrowing and current liabilities, in percentage), NPL (non-performing loan as measured by ratio of nonperforming loans to total loans, in percentage), DAR (debt to asset ratio as measured by ratio of total liabilities to total asset, in percentage), LLP (loan loss provision as measured by ratio of loan loss provision to total loans, in percentage), BSIZE(bank size , Rs. In billions)

Variables	ROA	ROE	OE	CAR	LR	NPL	DAR	LLP	BSIZE
ROA	1								
ROE	0.601**	1							
OE	-0.538**	-0.205**	1						
CAR	0.079	-0.028	-0.049	1					
LR	0.014	0.015	0.079	-0.146	1				
NPL	-0.141	-0.012	0.447**	0.040	-0.291**	1			
DAR	-0.199*	0.233 *	0.113	0.063	0.149	0.032	1		
LLP	-0.168	-0.113	0.135	0.075	0.126	0.262**	0.004	1	
BSIZE	-0.473**	-0.316**	0.465**	0.182	-0.333**	0.492**	0.088	0.197*	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 operational efficiency and return on assets. It indicates that increase in operation efficiency leads to decrease in return on assets. Similarly, there is a positive relationship between capital adequacy ratio and return on assets. It indicates that higher the capital adequacy ratio, higher would be the return on assets. Likewise, liquidity ratio has a positive relationship with return on assets. It indicates that increase in liquidity ratio 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. Furthermore, debt to assets ratio has a negative relationship with return on assets. It indicates that higher the debt to assets, lower would be the return on assets. Moreover, there is a negative relationship between loan loss provision and return on assets. It indicates that higher the loan loss provision, lower would be the return on assets. Furthermore, there is a negative relationship between bank size and return on assets. It indicates that higher the bank size, lower would be the return on assets.

On the other hand, the result shows that shows that there is a negative relationship between operation efficiency and return on equity. It indicates that increase in operation efficiency leads to decrease in return on equity. Similarly, there is a negative relationship between capital adequacy ratio and return on equity. It indicates that higher the capital adequacy ratio, lower would be the return on equity. Likewise, liquidity ratio has a positive relationship with return on equity. It indicates that increase in liquidity ratio leads to increase in return on equity. In addition, 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. Furthermore, debt to assets ratio has a positive relationship with return on equity. It indicates that higher the debt to assets ratio, higher would be the return on equity. Moreover, there is a negative relationship between loan loss provision and return on equity. It indicates that higher the loan loss provision, lower would be the return on equity. Furthermore, there is a negative relationship between bank size and return on equity. It indicates that higher the bank size, 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 operational efficiency ratio, capital adequacy ratio, liquidity ratio, non-performing loan, debt to assets ratio, loan loss provision and bank size on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of operational efficiency ratio, capital adequacy ratio, liquidity ratio, non-performing loan, debt to assets ratio, loan loss provision and bank size on return on assets

The results are based on panel data of 12 Nepalese commercial banks with 108 for the study period from 2014/15 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1OE + \beta_2CAR + \beta_3LR + \beta_4NPL + \beta_5DAR + \beta_6LLP + \beta_7BS + \epsilon$ where the dependent variables are ROA (Return on assets as measured by net income to total assets). The independent variables are OE (operational efficiency ratio 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), LR (liquidity ratio as measured by cash and other liquid assets to short term borrowing and current liabilities, in percentage), NPL (non-performing loan as measured by ratio of nonperforming loans to total loans, in percentage), DAR (debt to asset ratio as measured by ratio of total liabilities to total asset, in percentage), LLP (loan loss provision as measured by ratio of loan loss provision to total loans, in percentage), BSIZE(bank size, Rs. In billions)

Model	Intercept	Regression coefficients of							Adj. R_bar ²	SEE	F-value
		OE	CAR	LR	NPL	DAR	LLP	BSIZE			
1	2.716 (15.068)**	-0.027 (6.571)**							0.283	0.41	43.18
2	0.972 (3.356)**		0.043 (2.069) *						0.013	0.48552	32.837
3	1.574 (15.412)**			0.001 (0.147)					0.009	0.487	0.022
4	1.635 (23.717)**				- 0.053 (1.463)				0.011	0.482	2.142
5	4.422 (3.221)**					-0.032 (2.086) *			0.03	0.4773	4.351
6	1.66 (22.582)**						-0.062 (1.750)		0.019	0.48	3.062
7	2.013 (21.964)**							-0.031 (5.533)**	0.217	0.429	30.616
8	2.716 (15.025)**	-0.027 (6.515)**	0.062 (0.639)						0.279	0.411	21.675
9	2.465 (6.842)**	-0.027 (6.113)**	0.063 (0.753)	0.002 (0.356)					0.274	0.413	14.445
10	2.341 (6.467) **	-0.031 (6.38)**	0.024 (1.239)	0.005 (1.05)	-0.072 (1.881)				0.291	0.408	11.98
11	4.384 (3.004) **	-0.03 (6.36) **	0.011 (0.532)	0.006 (1.203)	- 0.067 (1.758)	-0.021 (1.445)			0.29	0.41	10.105
12	4.331 (2.987)**	-0.03 (6.338)**	0.014 (0.659)	0.005 (1.124)	-0.08 (2.05)*	-0.02 (1.398)	-0.048 (1.54)		0.308	0.403	8.93
13	3.16 (2.291)*	-0.022 (4.533)**	0.033 (1.653)	0.001 (0.239)	-0.124 (3.281)**	-0.009 (0.667)	-0.043 (1.47)	-0.027 (4.084)**	0.40	0.37	11.224

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 operational efficiency ratio are negative with return on assets. It indicates that operational efficiency ratio has a negative impact on return on assets. This finding is similar to the finding of Adam *et al.* (2018). Similarly, the beta coefficients for capital adequacy ratio are positive with return on assets. It means that capital adequacy ratio has a positive impact on return on assets. This finding is consistent with the finding of Mir and Shah (2022). Likewise, the beta coefficients for liquidity ratio are positive with return on assets. It indicates that liquidity ratio has a positive impact on return on assets. This finding is consistent with the finding of Zanieldeen (2018). Furthermore, 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 Uddin (2022). Moreover, the beta coefficients for debt to assets ratio has a negative impact with return on assets. It indicates that debt to assets ratio has a negative impact on return on assets. This finding is consistent with the finding of Idode (2014). Likewise, 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 finding of Ali (2020). Furthermore, the beta coefficients for bank size is negative with return on assets. It indicates that bank size has a negative impact on return on assets. This finding is consistent with the findings of Thi Thanh Tran and Phan (2020).

Table 5 shows the regression results of operational efficiency ratio, capital adequacy ratio, liquidity ratio, non- performing loan, debt to assets ratio, loan loss provision and bank size on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of operational efficiency ratio, capital adequacy ratio, liquidity ratio, non-performing loan, debt to assets ratio, loan loss provision and bank size on return on equity

The results are based on panel data of 12 Nepalese commercial banks with 108 for the study period from 2014/15 to 2022/23 by using the linear regression model and the model $ROE = \beta_0 + \beta_1OE + \beta_2CAR + \beta_3LR + \beta_4NPL + \beta_5DAR + \beta_6LLP + \beta_7BS + \epsilon$ where the dependent variables are ROE (Return on assets as measured by net income to total assets). The independent variables are OE (operational efficiency ratio 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), LR (liquidity ratio as measured by cash and other liquid assets to short term borrowing and current liabilities, in percentage), NPL (non-performing loan as measured by ratio of nonperforming loans to total loans, in percentage), DAR (debt to asset ratio as measured by ratio of total liabilities to total asset, in percentage), LLP (loan loss provision as measured by ratio of loan loss provision to total loans, in percentage), BSIZE(bank size , Rs. In billions).

Model	Intercept	Regression coefficients of						BSIZE	Adj. R_bar ²	SEE	F-value
		OE	CAR	LR	NPL	DAR	LLP				
1	21.475 (7.514)**	-0.150 (2.161)*							0.013	6.837	4.669
2	25.718 (6.281)**		-0.777 (2.61)**						0.052	6.77	6.84
3	14.946 (10.206)**			0.011 (0.15)					0.009	6.984	0.024
4	15.017 (15.079)**				- 0.232 (5.231)				0.192	6.985	0.015
5	-33.039 (1.691)					0.5422 (2.46)*			0.045	6.793	6.089
6	16.118 (15.166)**						-0.604 (1.175)		0.004	6.94	1.38
7	19.481 (0.296)							-0.296 (3.42)**	0.091	6.627	11.76
8	37.947 (6.8)**	-0.211 (3.09)	-1.018 (3.44)						0.123	6.512	8.48
9	37.627 (6.597)**	-0.213 (3.094)**	-1.017 (3.418)**	0.02 (0.302)					0.115	6.54	5.63
10	36.98 (6.36)**	-0.234 (3.034)**	-0.966 (3.12)**	0.037 (0.51)	-0.375 (0.60)				0.110	6.56	4.29
11	0.227 (0.11)	-0.238 (3.108)**	-0.739 (2.186)*	0.025 (0.338)	-0.462 (0.75)	0.381 (1.62)			0.123	6.51	4.014
12	-0.368 (0.016)	-0.234 (3.063)**	-0.709 (2.094)*	0.020 (0.279)	-0.600 (0.952)	0.390 (1.695)	-0.533 (1.016)		0.125	6.51	3.54
13	-16.187 (0.71)	-0.125 (1.558)	-0.447 (1.346)	-0.063 (0.85)	-1.199 (1.92)	0.541 (2.366)*	-0.463 (0.966)	-0.359 (3.33)**	0.204	6.20	4.93

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.
- Return on equity is the dependent variable.

Table 5 shows that beta coefficients for operational efficiency are negative with return on equity. It indicates that operating efficiency has a negative impact on return on equity. This finding is similar to the finding of Anggraeni (2022). Similarly, the beta coefficients for capital adequacy ratio are negative with return on equity. It means that capital adequacy ratio has a negative impact on return on equity. This finding is not consistent with the finding of Datta *et al.* (2018). Likewise, 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 consistent with the finding of Dahiyat (2016). Furthermore, 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 Kingu *et al.* (2018). Moreover, the beta coefficients for debt to assets ratio has a positive impact with return on equity. It indicates that debt to assets ratio has a positive impact on return on equity. This finding is consistent with the finding of Opoku (2016). Likewise, 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 finding of Islam (2018). Furthermore, the beta coefficients for bank size are negative with return on equity. It indicates that bank size has a negative impact on return on equity. This finding is consistent with the findings of Thi Thanh Tran and Phan (2020).

4. Summary and conclusion

Banking institutions are organizations that focus on financial intermediation, or distributing excess liquidity among different economic actors. Deposits and other liabilities from people or companies with excess resources are used in the research to lend money and other assets to economic agents with limited resources. Thus, banks are a critical part of financial system, which play a pivotal role in contributing to country's economic development. The existence of the banking sector becomes important because in carrying out life in the community involves services from the banking sector.

This study attempts to examine the effects of banking sectoral factors on the profitability of commercial banks in Nepal. 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 capital adequacy ratio and liquidity ratio have positive impact on return on assets. However operational efficiency, non-performing loan, debt to assets ratio, loan loss provision and bank loan have negative impact on return on assets. Similarly, liquidity ratio and debt to assets ratio have a positive impact on return on equity. However, operation efficiency, capital adequacy ratio, non-performing loan, loan loss provision and bank size have negative impact on return on equity. The study also showed that that inefficiencies in bank operations, coupled with an increase in non-performing loans and higher debt burdens, hinder profitability. Additionally, excessive loan loss provisions, reflecting poor credit quality, further erode ROA. Finally, while bank loans are essential for revenue generation, an uncontrolled increase in lending without proper credit risk assessment also negatively affects profitability.

References

- Acharya, K. R., & S. K. Vyas, 2022. The impact of bank-specific and macroeconomic variables on commercial banks profitability in Nepal. *Patan Pragma* 10(01), 74-85.
- Adam, M., R. Safitri, and T. Wahyudi, 2018. Effect of company size, liquidity and operational efficiency on banks' 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.
- 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(115), 14-27.
- Ahmed, A., and M. Ahmad, 2017. The effect of capital adequacy on profitability: A comparative study between Samba and Saab banks of Saudi Arabia. *International Journal of Economics, Commerce and Management* 5(11), 86-102.
- Akbas, H. E., 2012. Determinants of bank profitability: An investigation on Turkish banking sector. *Öneri Dergisi*, 10(37), 103-110.
- 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.
- Alexandri, M. B., and T. I. Santoso, 2015. Impact of internal and external factor: Evidence in Indonesia. *International Journal of Humanities and Social Science Invention* 4(1), 87-91

- 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.
- Ali, R., & D. A. Siddiqui, 2020. Do loan loss provisions enhance profitability through tax saving: *Evidence for Pakistani Banking Sector. Available at SSRN 3681221*.
- Almumani, M. A., 2013. Impact of managerial factors on commercial banks' profitability: Empirical evidence from Jordan. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 3(3), 298-310.
- Alzoubi, T., 2018. Determinants of banks' profitability: Islamic versus conventional banks. *Banks and Bank Systems* 13(3), 106-113.
- 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.
- Arasy, R. A., and S. S. Handayani, 2020. Influence of capital adequacy ratio, loan to deposits ratio, operational efficiency ratio, and non-performing loan on return on assets of SOES bank in 2016 to 2018. *International Journal of Economics, Commerce and Management* 8(6), 308-320.
- 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 Research in Economics and Management Sciences* 6(3), 153-170.
- Bashir, A. H. M., 2003. Determinants of profitability in Islamic Banks: Some Evidence from the Middle East. *Islamic Economics Studies* 11(1), 31-57.
- Beatty, A., and S. Liao, 2009. Regulatory capital ratios, loan loss provisioning and procyclicality. Columbus, United States: Ohio State University. *Mimeographed Document* 3(10), 87-93.
- Bhatti, G. A., & H. Hussain, 2010. Evidence on structure conduct performance hypothesis in Pakistani commercial banks. *International Journal of Business and Management* 5(9), 174-182.
- Boateng, K., 2019. The relationship between efficiency, productivity and profitability of Ghanaian banks. *IOSR Journal of Business and Management* 21(6), 52-60.
- Brigham, E. F., & J. F. Houston, 2013. *Fundamentals of Financial Management* (Cengage Learning, South-Western).
- 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.
- Budhiarjo, I. S., 2024. The effect of debt to asset ratio (DAR) and total assets turnover (TATO) on financial distress conditions at PT Gajah Tunggal Tbk. *Formosa Journal of Multidisciplinary Research* 3(5), 1541-1552.
- Capraru, B., and L. Ihnatov, 2014. Banks profitability in selected central and eastern European countries. *International Economic Journal* 16(1), 587-591.
- Dahiyat, A., 2016. Does liquidity and solvency affect banks profitability? Evidence from listed banks in Jordan. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 6(1), 35-40.
- 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.
- Demirhan, H. G. and W. Anwar, 2014. Factors affecting the financial performance of the firms during the financial crisis: Evidence from Turkey. *Ege Strategic Research Journal* 5(1), 65-80.
- Domanovic, V., V. Todorovic, and S. Savovic, 2018. Internal factors of bank profitability in the republic of Serbia.

Business and Economic Horizons 14(3), 659-673.

- Ebenezer, O. O., & W. A. W. Omar, 2016. The empirical effects of credit risk on profitability of commercial banks: Evidence from Nigeria. *International Journal of Science and Research* 5(8), 1645-1650.
- Fernando, W. D. I., and E. M. Ekanayake, 2015. Do commercial banks use loan loss provisions to smooth their income? Empirical evidence from Sri Lankan commercial banks. *Journal of Finance*, 3(1), 167-179.
- 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.
- Gurung, J. B., and N. Gurung, 2022. Factors determining profitability of commercial banks: Evidence from Nepali banking sector. *Prithvi Academic Journal*, 5(1), 100-113.
- Halkos, G. E., and D. S. Salamouris, 2004. Efficiency measurement of the Greek commercial banks with the use of financial ratios: A data envelopment analysis approach. *Management Accounting Research* 15(2), 201-224.
- Ibrahim, S. S., 2017. The impacts of liquidity on profitability in banking sectors of Iraq: A Case of Iraqi Commercial Banks. *International Journal of Finance & Banking Studies* 6(1), 113-121.
- Idode, P. E., T. M. Adeleke, A. J. Ogunlowore, & O. S. Ashogbon, 2014. Influence of capital structure on profitability: Empirical Evidence from listed Nigerian banks. *IOSR Journal of Business and Management* 16(11), 22-28.
- Iloska, N., 2014. An analysis of bank profitability in Macedonia. *Journal of Applied Economics and Business* 2(1), 31-50.
- 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, K. M., & A. B. Bhuiyan, 2021. Determinants of the effectiveness of internal Shariah audit: Evidence from Islamic banks in Bangladesh. *The Journal of Asian Finance, Economics and Business* 8(2), 223-230.
- 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.
- Jolevski, L., 2017. Non-performing loans and profitability indicators: The case of the republic of Macedonia. *Journal of Contemporary Economic and Business Issues* 4(2), 5-20.
- 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.
- Kalluru, S., and K. Bhat, 2009. Determinants of cost efficiency of commercial banks in India. *ICFAI Journal of Bank Management* 8(2), 32-50.
- 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.
- Kingu, P. S., S. Macha, & 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.
- Kusumastuti, W. I., & A. Alam, 2019. Analysis of impact of CAR, BOPO, NPF on Profitability of Islamic Banks. *Journal of Islamic Economic Laws* 2(1), 30-59.
- 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(13), 22-47.

- 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
- 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.
- Mbaeri, M. N., U. Uwalake, and J. T. Gimba, 2021. Capital adequacy ratio and financial performance of listed commercial banks in Nigeria. *Journal of Economics and Allied Research* 6(3), 81-88.
- 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.
- Mester, L. J., 2010. Scale economies in banking and financial regulatory reform. *The Region*, 24(3), 10-13.
- 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.
- Nahar, F. H., C. Faza, and M. Azizurrohman, 2020. Macroeconomic analysis and financial ratios on Sharia commercial banks' profitability: A case study of Indonesia. *Journal of Islamic Economics, Finance, and Banking* 3(1), 37-50.
- Niresh, A., and T. Velnampy, 2014. Firm size and profitability: A study of listed manufacturing firms in Sri Lanka. *International Journal of Business and Management* 9(4), 57-68.
- Niresh, J. A., 2012. Trade-off between liquidity & profitability: A study of selected manufacturing firms in Sri Lanka. *Researcher's World* 3(4), 34-39.
- Olalekan, A., & S. Adeyinka, 2013. Capital adequacy and banks' profitability: an empirical evidence from Nigeria. *American international journal of contemporary research* 3(10), 87-93.
- Ongore, V. O., & G. B. Kusa, 2013. Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial Issues* 3(1), 237-252.
- Opoku, R. T., P. L. Angmor, & L. A. Boadi, 2016. Credit risk and bank profitability: Evidence from Ghana stock exchange. *Journal for Studies in Management and Planning* 2(3), 89-96.
- Ozili, P. K., and E. Outa, 2017. Bank loan loss provisions research: A review. *Borsa Istanbul Review* 17(3), 144-163.
- Pelealu, I. W., & F. G. Worang, 2017. Analysis the effect of loan loss provision on bank profitability. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis Dan Akuntansi* 6(4), 65-69.
- Pradhan, R. S., and A. K. Shrestha, 2016. The impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. *Nepalese Journal of Management* 3(3), 1-11.
- Ramlall, I., 2009. Determinants of capital structure among non-quoted Mauritian firms under specificity of leverage: Looking for a modified pecking order theory. *International Research Journal of Finance and Economics* 31(31), 83-92.
- Regehr, K., & R. Sengupta, 2016. Has the relationship between bank size and profitability changed? *Economic Review* 101(2), 54-59.
- Rehman, M. Z., M. N. Khan, & I. Khokhar, 2015. Investigating liquidity-profitability relationship: Evidence from companies listed in Saudi stock exchange (Tadawul). *Journal of Applied Finance and Banking* 5(3), 159-164.
- Safitri, K. Y. D., I. M. Mertha, N. G. P. Wirawati, and A. A. Dewi, 2020. The impact 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.

- Saleem, Q., & R. U. Rehman, 2011. Impacts of liquidity ratios on profitability. *Interdisciplinary Journal of Research in Business* 1(7), 95-98.
- 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.
- Sari, F. N., and E. Endri, 2019. Determinants of return on assets on conventional banks listed on Indonesian stock exchange (IDX) period 2013–2017. *IOSR Journal of Business and Management* 21(4), 52-62.
- 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.
- Shuremo, G. A., 2016. Determinants of banks' profitability: Evidence from banking industry in Ethiopia. *International Journal of Economics, Commerce and Management* 4(2), 442-463.
- Smirlock, M., 1985. Evidence on the relationship between concentration and profitability in banking. *Journal of Money, Credit and Banking* 17(1), 69-83.
- Somoye, R. O. C., 2010. The variation of risks on non-performing loans on bank performances in Nigeria. *Indian Journal of Economics and Business* 9(1), 87- 99.
- Sritharan, V., 2015. Does firm size influence on firm's Profitability? Evidence from listed firms of Sri Lankan hotels and travels sector. *Research Journal of Finance and Accounting* 6(6), 201-207.
- Sufian, F., 2011. Profitability of the Korean banking sector: Panel evidence on bank-specific and macroeconomic determinants. *Journal of Economics and Management* 7(1), 43-72.
- Sufian, F., & M. S. Habibullah, 2009. Bank specific and macroeconomic determinants of bank profitability: Empirical evidence from the China banking sector. *Frontiers of Economics in China* 4(2), 274-291.
- Sunaryo, D., 2021. Analysis of current ratio, debt to assets ratio and gross profit margin on financial distress with moderated share prices in retail companies listed in securities exchange. *International Journal of Educational Research & Social Sciences* 2(1), 23-33.
- Sushmitha, G., and N. Nagaraja, 2020. Non-performing assets management in the co-operative banks in India: A descriptive analysis. *International Journal of Banking, Risk and Insurance* 8(1), 80-89.
- 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.
- Thi Thanh Tran, D., and H. T. T. Phan, 2020. Bank size, credit risk and bank profitability in Vietnam. *Malaysian Journal of Economic Studies* 57(2), 233-251
- 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.
- Widyastuti, U., E. D. Purwana, and S. Zulaihati, 2017. Internal determinants of commercial banks' profitability in Indonesia. *Mediterranean Journal of Social Sciences* 8(3), 219-219.
- Yuan, D., M. A. I. Gazi, I. Harymawan, B. K. Dhar, & A. I. Hossain, 2022. Profitability determining factors of banking sector: Panel data analysis of commercial banks in South Asian countries. *Frontiers in Psychology* 13(1), 100-114.
- Zaineldeen, M., 2018. Liquidity and profitability analysis in the Palestinian banking sector. *Journal of International Trade, Logistics and Law* 4(1), 44-53.

Chapter 7

Impact of Financial Risk and Capital Adequacy Ratio on the Profitability of Nepalese Commercial Banks

Puja Jha and Sumit Pradhan*

Abstract

This study examines the impact of financial risk and capital adequacy ratio 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 bank size, non-performing loan, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage. The study is based on secondary data of 11 commercial banks with 110 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 financial risk and capital adequacy ratio on the profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive effect on return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In contrast, capital adequacy ratio has a negative effect on return on equity. Similarly, non-performing loan ratio has a negative effect on return on equity. It indicates that increase in non-performing loan ratio leads to decrease in return on equity. Likewise, net interest margin has a positive effect on return on assets and return on equity. It indicates that increase in net interest margin leads to increase in return on assets and return on equity. In addition, loan-to-deposit ratio has a negative effect 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. Furthermore, leverage has a negative effect on return on assets. It indicates that increase in leverage ratio leads to decrease in return on assets. In contrast, leverage ratio has a positive effect on return on equity. It indicates that increase in leverage ratio leads to increase in return on equity.

Keywords: bank size, leverage, net interest margin, non-performing loan, capital adequacy ratio, loan-to-deposit ratio, return on equity, return on assets

1. Introduction

The banking sector is the driving force for a country's economy. It is important for banks to maintain good performance as it significantly affects the level of public trust (Safitri et al., 2020). Poor bank performance will lead to failure and lead to financial crises that will have negative consequences for economic development (Nuhiu et al., 2017). Profit is one of the main goals of the banking industry. Profitability is the company's ability to earn profits or a measure of the effectiveness of company management. A high level of profitability 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 (Suyono et al., 2017). The traditional goal of management is to maximize shareholder wealth. The management of the banks should use both sophisticated risk prediction models and various standard financial techniques to assess cash flows and associated unexpected risks in order to protect shareholders' interests. Risks are a constant part of doing business for commercial banks. This results

* Ms. Usha is a Freelance Researcher, Kathmandu, Nepal and Mr. Pradhan is the Research Faculty, Uniglobe College (Pokhara University affiliate), Kathmandu, Nepal.

in banks having to pay more money to finish a certain financial operation, losing assets, or seeing actual profits drop below expectations. The profitability performance of a bank is correlated with and influenced by several parameters. The main indicators of a bank's performance are its capital structure/leverage, non-performing loan percentage, operating efficiency, and capital adequacy ratio (Harahap, 2018).

The primary source of revenue for the bank is credit activity, so credit risk has a significant effect on the bank's stability. 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). Sucuahi and Cambarihan (2016) showed that higher bank profitability will increase the value of the bank. A bank's ability to generate net profit by utilizing the entire resources will increase investor appreciation, as reflected in the higher firm value. In addition to the profitability, capital structure also significantly impacts the firm value of banks. For developing economies to experience rapid economic growth, commercial banks must operate with efficiency. But their bankruptcy triggers a financial catastrophe. Perera *et al.* (2014) found over 80 percent of bank balance sheet items are subject to this kind of risk, which calls for the most attention. Van Gestel and Baesens (2008) found that the intermediation function of commercial banks gives rise to a variety of risks with varying magnitudes and levels of impact on bank performance. These risks include credit risk, liquidity risk, market risk, and operational risk.

Siddique *et al.* (2020) conducted comparative study of performance of commercial banks in ASIAN developing and developed countries. The study revealed that there is a negative relationship of bank size with most of financial performance variables. Similarly, capital adequacy ratio has significant positive relationship with the financial performance (ROA and ROE). Likewise, Al Zaidanin and Al Zaidanin (2021) assessed the impact of credit risk management on the financial performance of United Arab Emirates commercial banks. The study revealed that capital adequacy ratio, liquidity ratio, and loans -to-deposits ratio have a very weak positive relationship with the return on assets. Moreover, Hunjra (2022) analyzed the effect of firm-specific risks on bank performance of commercial banks of South Asia. The study revealed that loan-to-deposit (LTD) ratios has negative effect on the financial performance. Similarly, Kwashie (2022) investigated the impact of credit risk on financial performance of commercial banks in Ghana. The study showed that the size of bank has a significant positive effect on financial performance measured by return on asset. Further, Yeasin (2022) assessed the impact of credit risk management on financial performance of commercial banks in Bangladesh. The study revealed that loan to deposit ratio has positive and statistically significant impact on financial performance of commercial banks. Serrano (2021) suggested that banks with lower rate of non-performing loans tend to lend more to the real economy. An increase in NPLs would lead to higher provisions, lower profitability, and considerable erosion in bank capital so the regulator should apply closer screening and monitoring of the risk of loan default in order to maximize profits.

Ramadhanti *et al.* (2019) investigated how commercial banks' profitability was impacted by credit risk, liquidity, and capital adequacy. The study found that profitability is significantly impacted favorably by the capital adequacy ratio (CAR). Similarly, the profitability of banks is significantly impacted negatively by non-performing loans (NPL). In the context of Indonesia, Rajindra *et al.* (2021) investigated the impact of costs, operational revenue, and the loan to deposit ratio on return on assets. The study found that operational costs, operational income, and loan to deposit ratio have

a significant effect on return on assets. Similarly, operational costs and operational income have a significant negative impact on return on equity. Moreover, Setiawan and Nupus (2021) examined the effect of capital adequacy ratio and loan to deposit ratio on banking profitability. The study revealed that capital adequacy ratio (CAR) and loan to deposit ratio (LDR) have a positive and significant influence on the profitability in State Owned Banks. In order to determine profitability, Agustiningrum (2013) examined loan to deposit ratios (LDR) and non-performing loans (NPL). The study demonstrated that profitability is positively and significantly influenced by the loan to deposit ratio. Ruslan et al. (2019) analyzed the mediating role of bank efficiency in the effect of bank size on bank profitability during 2010-2017. The data analysis technique in this study is path analysis (path analysis) with the help of AMOS software (Analysis of Moment Structure). The results of the study found that bank size has a positive and significant effect on bank efficiency. Similarly, bank size has a positive and not significant effect on bank profitability. Hirindu Kawshala (2017) examined the effect of bank specific factors of profitability in Sri Lankan domestic commercial banks. The regression results revealed that size, capital ratio and deposit ratio are significant and positively related to bank profitability. Velnampy and Nimalathan (2010) assessed the effect of the firm size on profitability of virtually all the branches of Bank of Ceylon (BOC) and Commercial Bank of Ceylon Ltd (CBC). The results showed that there is a positive relationship between Firm size and Profitability in Commercial Bank of Ceylon Ltd. Quoc and My (2023) examined the effect of bank capital on bank profitability using data gathered from 22 Vietnam commercial banks from 2011 to 2020, employing Pooled OLS, FEM, REM, and GMM methodologies. The results showed that bank capital has a negative relationship with bank profitability. Bank profitability is also positively affected by bank size, credit risk, credit growth, and capital adequacy ratio. Mule et al. (2015) examined corporate size, profitability and market value using an econometric panel analysis of listed firms in Kenya. The study revealed that there is a positive significant relationship between firm size and profitability implying that a unit change in firm size leads to an increase in return on equity of firms.

In context of Nepal, Budhathoki *et al.* (2020) showed that the bank's return on equity and return on assets are negatively impacted by a larger loan to deposit ratio, which is a sign of inadequate liquidity. Chhetri (2021) revealed that bank size and the capital adequacy ratio have a negative and statistically insignificant effect on financial performance (ROA). Bhattarai (2020) revealed that the financial performance of insurance businesses in Nepal is significantly influenced by equity to total assets, leverage, and assets tangibility. Neupane (2020) inspected into the main factors that affect Nepalese commercial banks' profitability. The results demonstrated that the size of the bank had no apparent effect on return on assets. Tharu and Shrestha (2019) examined how Nepal's commercial banks' profitability was impacted by their size. The findings showed that the bank's size (assets) has no discernible impact on profitability (ROA). Khatri (2020) analyzed the connection between Nepalese commercial banks' profitability and liquidity. The study found that the credit-deposit ratio has a negative and insignificant association with return on equity and a positive but insignificant with return on assets. Gautam (2018) examined the factors influencing Nepalese commercial banks' financial performance. The study indicated that capital adequacy ratio has a significant impact on commercial banks' financial performance.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of financial risk and capital adequacy ratio on the 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 major objective of the study is to examine the impact of financial risk and capital adequacy

ratio on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of bank size, non-performing loan, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage on return on assets and return on equity 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 2013/14 to 2022/23, leading to a total of 110 observations. The study has employed convenience sampling method. The main sources of data are Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of different sample banks, supervision report of Nepal Rastra Bank and websites of respective 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
Public banks			
1	Nepal Bank Limited	2013/14-2022/23	10
2	Agricultural Development Bank Limited	2013/14-2022/23	10
Joint venture banks			
3	Himalayan Bank Limited	2013/14-2022/23	10
4	Everest Bank Limited	2013/14-2022/23	10
5	Nepal SBI Bank Limited	2013/14-2022/23	10
6	Standard Chartered Bank Nepal Limited	2013/14-2022/23	10
Private banks			
7	Machhapuchchhre 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	Prime Commercial Bank Limited	2013/14-2022/23	10
11	Citizens International Bank Limited	2013/14-2022/23	10
Total number of observations			110

Thus, the study is based on 110 observations.

The model

The model used in this study assumes that profitability of banks depends upon financial risk and capital adequacy ratio. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage. Therefore, the models take the following forms

$$ROA = \beta_0 + \beta_1 BS + \beta_2 NPL + \beta_3 CAR + \beta_4 LTD + \beta_5 NIM + \beta_6 LEV + e_{it}$$

$$ROE = \beta_0 + \beta_1 BS + \beta_2 NPL + \beta_3 CAR + \beta_4 LTD + \beta_5 NIM + \beta_6 LEV + e_{it}$$

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.

BS = 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.

NIM = Net interest margin as measured by the ratio of net interest income to total assets, in percentage.

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

LDR = Credit to deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

LEV = Leverage as measured by the ratio of debt to shareholder's equity, in percentage.

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

Bank size

Anggari and Dana (2020) investigated the effect of capital adequacy ratio, third party funds, loan to deposit ratio, bank size on profitability in banking companies. The results of this study revealed that the capital adequacy ratio, third party fund and bank size have a positive and significant effect on profitability. Jaouad and Lahsen (2018) examined the effects of bank-specific characteristics, bank governance, financial market structure, and macroeconomic conditions on Moroccan banks' performance. The findings showed that only cost-to-income ratio (COST) is highly significant and negatively related to bank's performance. The result also revealed that bank size (SIZE) is positively related to ROA and statistically significant. Mule *et al.* (2015) assessed the relationship between corporate size, profitability and firm value listed companies at the Nairobi Securities Exchange using data for the period 2010 through 2014. The study indicated that there is a positive and significant relationship between firm size and return on equity. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between bank size and profitability of banks.

Non-performing loan

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. Reddy (2004) argued that bank's lending policy has a crucial influence on a non-performing loan of the banks. Badar and Yasmin (2013) found an increase in non-performing loan provision diminishes income. 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. Based on it, this study develops

the following hypothesis:

H₂: There is a negative relationship between non-performing loan and profitability of banks.

Capital adequacy ratio

Olarewaju and Akande (2016) found that there is a significant positive relationship between ROA and capital level. According to Dao and Nguyen (2016), CAR ratio has a positive relationship with ROA and a negative one with ROE. Similarly, Sufian and Habibullah (2009) analysed the relationship between capital adequacy and profitability in the banking sector. The study discovered that there was a positive correlation between capital adequacy and profitability. Juwita (2018) investigated the effect of CAR (capital adequacy ratio), BOPO (operational costs on operational revenues) and LDR (loan to deposit ratio) on ROA (return on assets). The study concluded that there is a positive and significant effect of capital adequacy ratio to return on assets. Athanasoglou *et al.* (2008) used SCP hypothesis with the support of GMM technique in order to illustrate that the capital adequacy positively significant influences ROA in Chinese commercial banks. This is because a bank with a sound capital position is able to pursue business opportunities more effectively and it has more time as well as the flexibility to deal with problems arising from unexpected losses, and therefore it is enabled to achieve higher profitability. Based on it, this study develops the following hypothesis:

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

Loan-to-deposit ratio

Kowoon *et al.* (2022) assessed the effect of return on equity, net interest margin, loan to deposit ratio, total assets turnover, and assets to equity on price earnings ratio in top five banks of Indonesia and Korea. The study showed that there is a negative relationship between loan-to-deposit ratio and firm value. Yigermal (2017) analyzed the impact of bank specific and macro-economic factors on the profitability of selected Ethiopian private commercial banks. The study concluded that credit to deposit ratio is negatively related to profitability. Similarly, Vellanita *et al.* (2019) revealed a negative relationship between credit to deposit ratio and return on equity. Likewise, Golubeva *et al.* (2019) showed that credit to deposit ratio has a negative relationship with return on equity. Mohanty and Krishnankutty (2018) showed that return on asset has a negative and significant relationship with credit to deposit ratio. Hutapea (2019) revealed that loan-to-deposit ratio has a negative effect on firm value. Moreover, Hutapea (2019) showed that there is a negative and insignificant relationship between loan-to-deposit ratio and firm value. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between loan-to-deposit ratio and profitability of banks.

Net interest margin

Net interest margin (NIM) is the ratio of net interest income to total interest-earning assets. It is measured by the difference between interest revenues received from loans and interest costs paid for deposits. Le *et al.* (2022) found that net interest margin has a positive and significant effect on profitability. Similarly, Marlina (2022) concluded that NIM has a positive and insignificant effect on ROA. Banks with higher net interest margins may have a competitive advantage in the market, allowing them to attract deposits at lower interest rates while charging higher interest rates on loans. This pricing power enables them to maintain higher margins and profitability compared to their competitors. Likewise, Sukmadewi (2020) stated that net interest margin has a positive and significant effect on return on assets. Furthermore, Widyakto *et al.* (2021) revealed that NIM incorporates a critical positive impact on ROE. Based on it, the study develops following hypothesis:

H_5 : There is a positive relationship between net interest margin and profitability of banks.

Leverage

Pattitoni et al. (2014) suggested that an increase in debt use results in a decrease in equity returns. Actually, when businesses take on more debt, they have to pay more interest, which puts them in a cash crunch because they have to make debt payments on a regular basis. Abubakar (2015) found debt-equity ratio and return on equity (ROE) a proxy for financial performance is negatively related. Birru (2016) investigated the impact of capital structure on financial performance of selected commercial banks in Ethiopia. The results showed that financial performance is significantly and negatively associated with debt-to-equity ratio and size. Further, Ulzanah and Murtaqi (2015) examined the impact of earnings per share, debt to equity ratio, and current ratio toward the profitability. The results of the study showed that debt to equity ratio have significant impact on profitability (ROA). The study also revealed that debt to equity ratio has a negative significant impact on profitability (ROA). This financial strain comes before they see a drop in their operational performance. Similarly, financial leverage has a statistically significant unfavorable influence on profitability (Ahmad et al., 2015). Based on it, this study develops the following hypothesis:

H_6 : There is a negative relationship between operating efficiency 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 2013/14 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 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 ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are BS (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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage) and LEV (Leverage as measured by the ratio of total debt to total shareholder's equity, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.460	3.120	1.605	0.525
ROE	3.780	42.940	14.796	5.554
BS	29.377	332.392	130.067	66.494
NPL	0.010	5.460	1.409	1.312
LTD	48.920	96.080	81.960	9.423
CAR	9.600	22.990	14.020	2.461
NIM	1.860	5.600	3.225	0.719
LEV	4.118	14.413	8.325	2.169

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 variables of 11 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 ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are BS (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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage) and LEV (Leverage as measured by the ratio of total debt to total shareholder's equity, in percentage).

Variables	ROA	ROE	CAR	NPL	LTD	NIM	LEV	BS
ROA	1							
ROE	0.633**	1						
CAR	0.414**	-0.055	1					
NPL	0.040	-0.220*	0.088	1				
LTD	-0.174	-0.250**	-0.186	0.004	1			
NIM	0.646**	0.222*	0.368**	0.528**	-0.092	1		
LEV	-0.241*	0.476**	-0.624**	-0.249**	-0.096	-0.354**	1	
BS	-0.455**	-0.506**	0.080	0.149	0.272**	-0.187	-0.164	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. 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. Likewise, there is a positive relationship between net interest margin and return on assets. It indicates that increase in net interest margin leads to increase in return on assets. In contrast, 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. In addition, leverage has a negative relationship with return on assets. It indicates that increase in leverage ratio leads to decrease in return on assets. Moreover, bank size has a negative relationship with return on assets. It indicates that larger the bank size, 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 ratio and return on equity. It indicates that increase in non-performing loan ratio leads to decrease in return on equity. Likewise, there is a negative relationship between loan to deposit ratio and return on equity. It indicates that increase in net interest margin leads to decrease in return on equity. In contrast, net interest margin has a positive relationship with return on equity. It indicates that higher the net interest margin, higher would be the return on equity. In addition, leverage ratio has a positive relationship with return on equity. It indicates that increase in leverage ratio leads to increase in return on equity. Moreover, bank size has a negative relationship with return on equity. It indicates that larger the bank size, 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 and Table 5. More specifically, Table 4 shows the regression results of bank size, non-performing loans, capital adequacy ratio, net interest margin, loan-to-deposit ratio, net interest margin and leverage with return on asset of Nepalese commercial banks.

Table 4

Estimated regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage on return on assets

The results are based on panel data of 11 commercial banks with 110 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 BS_{it} + \beta_2 NPL_{it} + \beta_3 LTD_{it} + \beta_4 CAR_{it} + \beta_5 NIM_{it} + \beta_6 LEV_{it} + e_{it}$ 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 BS (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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage) and LEV (Leverage as measured by the ratio of total debt to total shareholder's equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		BS	NPL	LTD	CAR	NIM	LEV			
1	2.072 (21.011)**	-0.004 (5.317)**						0.200	0.469	28.268
2	1.582 (21.423)**		0.016 (0.416)					0.008	0.526	0.173
3	2.397 (5.508)**			-0.010 (1.832)				0.021	0.519	3.357
4	0.369 (1.387)				0.088 (4.723)**			0.164	0.479	22.31
5	0.085 (0.479)					0.471 (8.789)**		0.412	0.402	77.239
6	2.09 (10.757)**						-0.058 (2.579)**	0.049	0.511	6.649
7	2.027 (19.39)**	-0.004 (5.463)**	0.044 (1.278)					0.205	0.467	15.033
8	2.239 (5.637)**	-0.004 (5.084)**	0.043 (1.251)	-0.003 (0.554)				0.200	0.469	10.059
9	0.485 (1.072)	-0.004 (6.568)**	0.031 (1.017)	0.003 (0.661)	0.098 (5.982)**			0.397	0.407	18.965
10	-0.914 (0.531)	-0.002 (4.701)**	-0.111 (3.756)**	0.001 (0.240)	0.048 (3.394)**	0.475 (8.095)**		0.627	0.320	37.6
11	-0.315 (0.568)	-0.002 (4.652)**	-0.109 (3.65)**	0.001 (0.305)	0.051 (2.884)**	0.477 (8.056)**	0.006 (0.291)	0.623	0.321	31.072

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 asset is the dependent variable.

Table 4 shows that the beta coefficients for bank size are negative with return on assets. It indicates that bank size has a negative impact on return on assets. This finding is similar to the findings of Jaouad and Lahsen (2018). However, the beta coefficients for non-performing loan ratio are positive with return on assets. It indicates that non-performing loan ratio has a positive impact on return on assets. This finding contradicts with the findings of Safitri and Oktavia (2022). Moreover, 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 Kowoon et al. (2022). In addition, 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 Juwita (2018). Further, the beta coefficients for net interest margin are positive with return on assets. It indicates that net interest margin has a positive impact on return on assets. This finding is similar to the findings of Sukmadewi (2020). Moreover, the beta coefficients for leverage are negative with return on assets. It indicates that leverage has a negative impact on return on assets. This finding is similar to the findings of Birru (2016).

Table 5 shows the estimated regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage on return on equity.

Table 5

Estimated regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, net interest margin, and leverage on return on equity

The results are based on panel data of 11 commercial banks with 110 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 BS_{it} + \beta_2 NPL_{it} + \beta_3 LTD_{it} + \beta_4 CAR_{it} + \beta_5 NIM_{it} + \beta_6 LEV_{it} + e_{it}$ 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 BS (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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage) and LEV (Leverage as measured by the ratio of total debt to total shareholder's equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		BS	NPL	LTD	CAR	NIM	LEV			
1	20.292 (20.055)**	-0.042 (6.095)**						0.249	4.813	37.145
2	16.11 (21.101)**		-0.932 (2.345)*					0.040	5.442	5.500
3	26.869 (5.931)**			-0.147 (2.682)**				0.054	5.402	7.194
4	16.536 (5.359)**				-0.124 (0.572)			0.006	5.571	0.328
5	9.269 (3.87)**					1.714 (2.364)*		0.040	5.440	5.587
6	4.652 (2.496)*						1.219 (5.622)**	0.219	4.907	31.612
7	20.936 (19.659)**	-0.04 (5.821)**	-0.626 (1.781)					0.264	4.765	20.531
8	26.727 (6.665)**	-0.037 (5.219)**	-0.647 (1.847)	-0.075 (1.498)				0.272	4.737	14.594
9	27.992 (5.295)**	-0.037 (5.109)**	-0.637 (1.809)	-0.079 (1.536)	-0.070 (0.369)			0.266	4.757	10.890
10	23.455 (4.598)**	-0.026 (3.588)**	-1.582 (3.85)**	-0.093 (1.917)	-0.400 (2.018)*	3.174 (3.878)**		0.353	4.468	12.885
11	-12.764 (2.099)*	-0.023 (4.019)**	-1.177 (3.579)**	-0.013 (0.320)	0.53 (2.709)**	3.596 (5.537)**	1.716 (7.959)**	0.595	3.532	27.733

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 bank size are negative with return on equity. It indicates that bank size has a negative impact on return on equity. This finding is not similar to the findings of Jaouad and Lahsen (2018). Similarly, the beta coefficients for non-performing loan ratio

are negative with return on equity. It indicates that non-performing loan ratio has a negative impact on return on equity. This finding is similar to the findings of Badar and Yasmin (2013). Likewise, the beta coefficients for loan to deposit 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 Yigermal (2017). Further, 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 consistent with the findings of Sufian and Habibullah (2009). Moreover, the beta coefficients for net interest margin are positive with return on equity. It indicates that net interest margin has a positive impact on return on equity. This finding is similar to the findings of Widyakto *et al.* (2021). Furthermore, the beta coefficients for leverage are positive with return on equity. It indicates that leverage has a positive impact on return on equity. This finding is similar to the findings of Pattitoni *et al.* (2014).

4. Summary and conclusion

Banking institutions are business entities dedicated to financial intermediation, involving the allocation of surplus liquidity among different economic agents. They use deposits and other liabilities from people or firms with a surplus of resources, redirecting them to economic agents who lack such resources, in the form of loans and other assets. The banking sector is a pivotal segment in many countries so there is a need for continuous implementation of adequate policy measures and reforms in order to ensure that the banking sector performs its function efficiently. Commercial banks have a greater capacity for varying the aggregate volume of credit than other financial intermediaries. A sound, profitable, competent and well managed banks enables both the economy and the country to stay competitive and able to withstand any negative shocks.

This study attempts to analyse the impact of financial risk and capital adequacy ratio on the profitability of Nepalese commercial banks. The study is based on secondary data of 11 commercial banks with 110 observations for the period from 2013/14 to 2022/23.

The study showed that bank size and loan to deposit ratio have negative impact on return on assets and return on equity. Similarly, leverage has a negative impact on return on assets. Likewise, non-performing loan, capital adequacy ratio and net interest margin have positive impact on return on assets. However, non-performing loan and capital adequacy ratio have negative impact on return on equity. Likewise, net interest margin and leverage have positive impact on return on equity. In addition, the study also concluded that bank size followed by capital adequacy ratio, net interest margin and leverage is the most influencing factor that affects the return on asset of Nepalese commercial banks. Similarly, the study also concluded that bank size, loan to deposit ratio and leverage is the most influencing factor followed by non performing loan and net interest margin that explains the changes in return on equity in the context of Nepalese commercial banks.

References

- Abubakar, A., 2015. Relationship between financial leverage and financial performance of deposit money banks in Nigeria. *International Journal of Economics, Commerce and Management* 3(10), 759-778.
- Agustiningrum, R., 2013. Analysis of non-performing loans and loan to deposit ratio towards profitability. *International Journal of Multicultural and Multireligious Understanding* 8(1), 423-436.
- Ahmad, N., A. Salman, and A. Shamsi, 2015. Impact of financial leverage on firms' profitability: An investigation from cement sector of Pakistan. *Research Journal of Finance and Accounting* 6(7), 22-29.
- Al Zaidanin, J. S., and O. J. Al Zaidanin, 2021. The impact of credit risk management on the financial performance of United Arab Emirates commercial banks. *International Journal of Research in Business and Social*

Science 10(3), 303-319.

- 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.
- Athanasoglou, P., S. Brissimis, and M. Delis, 2008. Bank specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money* 18(2), 121-136.
- Badar, M. B., and J. Yasmin, 2013. Impact of macroeconomic forces on non- performing loans, an empirical study of commercial banks in Pakistan. *Journal of Transactions on Business and Economics* 10(1), 40-48.
- 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.
- Birru, M. W., 2016. The impact of capital structure on financial performance of commercial banks in Ethiopia. *Global Journal of Management and Business Research* 16(8), 43-52.
- Budhathoki, P. B. C. K. Rai, K. P. Lamichhane, G. Bhattarai, and A. Rai, 2020. The impact of liquidity, leverage, and total size on banks' profitability: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 545-555.
- Chhetri, G. R., 2021. Effect of credit risk management on financial performance of Nepalese commercial banks. *Journal of Balkumari College* 10(1), 19-30.
- 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.
- Gautam, R., 2018. Determinants of financial performance: evidence from Nepalese commercial banks. *Amity Journal of Strategic Management*, 1(2), 7-13.
- 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.
- Harahap, I. M., 2018. Impact of bank performance on profitability. *Journal of Economics, Business and Management* 5(8), 727-733.
- Hirindu Kawshala, K., 2017. The factors effecting on bank profitability. *International Journal of Scientific and Research Publications* 7(2), 212-216.
- Hunjra, A. I., A. Mehmood, H. P. Nguyen, and T. Tayachi, 2022. Do firm-specific risks affect bank performance? *International Journal of Emerging Markets* 17(3), 664-682.
- 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.
- Hutapea, N. A., 2019. Analysis of factor affecting firm value with dividend policy as moderating variables in registered banking companies in Indonesia stock exchange. *International Journal of Public Budgeting, Accounting and Finance* 2(3), 1-15
- Hutasuhut, A. E., 2019. Factors affecting growth of profit and its impact on the value of banking firms in Indonesia stock exchange 2013-2017. *International Journal of Public Budgeting, Accounting and Finance* 2(4), 1-11.
- Jaouad, E., and O. Lahsen, 2018. Factors affecting bank performance: empirical evidence from Morocco. *European Scientific Journal* 14(34), 255-267.
- 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.
- Khati, P., 2020. Impact of liquidity on profitability of Nepalese commercial banks. *IOSR Journal of Economics and Finance*, 11(5), 26-33.
- Kowoon, Y., R. Sembel, and M. Malau, 2022. The effect of return on equity, net interest margin, loan to deposit ratio, total assets turnover, and assets to equity on price earnings ratio in top five banks of Indonesia and Korea: A moderating effect of interest rate. *International Journal of Business, Economics and Law* 27(1), 71-84.
- 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), 210- 281.
- Le, D. K., T. M. N. Tran, and V. D. Nguye, 2022. Factors affecting the performance of Vietnamese commercial banks: does Basel II matter? *The Journal of Asian Finance, Economics and Business* 9(3), 43-51.
- Marlina, R., 2022. Determinants of bank profitability in Indonesia based on commercial bank business activities. *The Journal of Asian Finance, Economics and Business* 9(1), 31-46.
- 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.
- 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.
- Neupane, B. P., 2020. Profitability determines of Nepalese commercial banks. *Press Academia Procedia* 12(1), 1-15.
- 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.
- Olarewaju, O. M., and J. O. Akande, 2016. An empirical analysis of capital adequacy determinants in Nigerian Banking Sector. *International Journal of Economics and Finance* 8(12), 132-142.
- Pattitoni, P., B. Petracci, and M. Spisni, 2014. Determinants of profitability in the EU-15 area. *Journal Applied Finance and Economy* 24(11), 763-775.
- Perera, A., D. Ralston, and J. Wickramanayake, 2014. Impact of off-balance sheet banking on the bank lending channel of monetary transmission: Evidence from South Asia. *Journal of Journal of International Financial Markets, Institutions and Money* 29(1), 195–216.
- Quoc, A. N., and S. T. My, 2023. Bank capital and bank profitability of Vietnam commercial banks. *International Journal of Business and Society* 24(1), 56-65.
- 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 profitability of commercial banks. *Journal of Economics, Business, and Government Challenges*, 2(1), 71-78.
- Reddy, Y. V., 2004. Financial sector reforms and balance sheet management. *Journal of Business* 5(13), 124-132.
- Ruslan, A., C. Pahlevi, S. Alam, and M. Nohong, 2019. The role of efficiency mediation in the effect of banks size on bank profitability in Indonesia. *Hasanuddin Economics and Business Review* 3(1), 49-58.

- 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.
- Serrano, A. S., 2021. The impact of non-performing loans on bank lending in Europe: An empirical analysis. *The North American Journal of Economics and Finance* 55(1), 1-12.
- 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.
- Siddique, A. O., K. Masood, and D. T. N. Huy, 2020. A comparative study of performance of commercial banks in ASIAN developing and developed countries. *Insights into Regional Development* 2(2), 580-591.
- Sucuahi, W., and J. M. Cambarihan, 2016. Influence of profitability to the firm value of diversified companies in the Philippines. *Accounting and Finance Research* 5(2), 149-153.
- 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* 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.
- Suyono, C., S. Teddy, and J. Irawati, 2017. Analysis of Factors Affecting Banking Profitability (Sudi Commercial Bank in Indonesia Period 2006-2010). *Procuratio* 5(2), 262-275.
- 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.
- Ulzanah, A. A., and I. Murtaqi, 2015. The impact of earnings per share, debt to equity ratio, and current ratio towards the profitability of companies listed in LQ45 from 2009 to 2013. *Journal of Business and Management* 4(1), 18-27.
- Van Gestel, T., and B. Baensens, 2008. *Credit Risk Management: Basic Concepts: Financial Risk Components, Rating Analysis, Models, Economic and Regulatory Capital* (Oxford University Press, Oxford).
- Vellanita, A., I. G. Arimbawa., and E. Damayanti, 2019. Relationship between non- performing loans (NPL), capital adequacy ratio (CAR), loan-to-deposit ratio (LDR) towards return on equity (ROE) at pt. bank central Asia. *Journal of World Conference* 1(2), 211-216.
- Velnampy, T., and B. Nimalathan, 2010. Firm size on profitability: A comparative study of Bank of Ceylon and Commercial Bank of Ceylon Ltd in Sri Lanka. *Global Journal of Management and Business Research* 10(2), 96-100.
- Widyakto, A., Y. Suhardjo, R. L. P. NSS, and A. Ardiansari, 2021. Analysis of the impact of NIM, LDR and NPL on bank profitability with variable mediating firm size (empirical study on public banks listed on IDX in 2015-2019). *Management Analysis Journal* 10(3), 257-263.
- Yasin, H. M., 2022. Impact of credit risk management on financial performance: A study of commercial banks in Bangladesh. *Interdisciplinary Journal of Applied and Basics Subjects* 2(1), 14-22.
- Yigermal, M. E., 2017. The determinants of private commercial banks profitability: In the case of selected Ethiopian private banks. *International Journal of Economic Behavior and Organization* 5(1), 25-35.

Chapter 8

Impact of Capital Structure, Firm Size, Sales Growth, and Asset Tangibility on Profitability of Nepalese Commercial Banks

Joshila Dahal*

Abstract

This study examines the impact of capital structure, firm size, sales growth, and asset tangibility on the profitability of Nepalese commercial banks. Return on equity, net interest margin, and return on assets are the selected dependent variables. The selected independent variables are debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size. The study is based on secondary data of 15 commercial banks with 105 observations for the 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. The correlation coefficients and regression models are estimated to test the significance and importance of capital structure, firm size, sales growth, and asset tangibility on the profitability of Nepalese commercial banks.

The study showed that assets tangibility has a positive effect on return on assets and net interest margin. It indicates that increase in assets tangibility leads to increase in return on assets and net interest margin. In addition, debt to equity ratio has a negative effect on return on assets and net interest margin. It indicates that higher the debt-to-equity ratio, lower would be the return on assets and net interest margin. In contrast, debt to assets ratio has a positive effect on return on assets, return on equity and net interest margin. It indicates that increase in debt to assets ratio leads to increase in return on assets, return on equity and net interest margin. Moreover, debt service coverage ratio has a negative effect on net interest margin. It indicates that increase in debt service coverage ratio leads to decrease in net interest margin. However, debt service coverage ratio has a positive effect on return on assets and return on equity. It indicates that increase in debt service coverage ratio leads to increase in return on assets and return on equity. Likewise, assets tangibility has a positive effect on net interest margin. It indicates that increase in assets tangibility leads to increase in net interest margin.

Keywords: debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, firm size, return on equity, net interest margin, return on assets

1. Introduction

The growth and financial stability of the country depends on the financial soundness of its banking sector. Sound financial health of the banks is the guarantee not only to their depositors but is equally significant for the shareholders, employees, and the economy as a whole (Mohiuddin, 2014). At the firm level, a higher return to a large extent reduces bank fragility. At the macro level, increased profitability makes for a sustainable banking sector that can finance economic growth and development (Osugwu, 2014). More precisely, it is a mirror image of quality of a bank's management and the shareholders behaviour as well as the banks risk management capabilities. The health of the financial sector is a major concern of policy, especially in developing economies where failure in financial intermediation can disturb the economic growth and retards the development processes (Das and Ghosh, 2013). Banks are the principal source of credit (loanable funds) for millions of individuals and

* Ms. Dahal is a Freelance Researcher, Kathmandu, Nepal.

families and for many units of government and businesses. Capital structure refers to the proportions or combination of equity share capital, preference share capital, debenture, long-term loans, retained earnings and other long-term sources of fund in the total amount of capital which a firm should raise to run its business. The capital structure of a company is particularly important because it impacts on the ability of the firm to take up investment opportunities. The decision on capital structure is crucial for both managers and regulators as well as for the shareholders (Tarek *et al.*, 2014).

Commercial banks are working as development assistants and strongly contributing to the growth and development of an economy all over the world. Banking sector is treated as the leading driving force of an economy and capital adequacy is the amount of capital a bank or other financial institution has to hold as required by its financial regulator (Swandewi and Purnawati, 2021). Ramadhanti *et al.* (2019) examined the effect of capital adequacy, liquidity and credit risk on the performance of commercial banks. The study revealed that capital adequacy ratio (CAR) has a significant positive impact on performance. Similarly, non-performing loan (NPL) has a negative and significant impact on financial performance. Similarly, Rajindra *et al.* (2021) examined the effect of costs and operational revenue and 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 significant impact on ROA. Similarly, operational costs and operational income have significant negative impact on return on assets. Moreover, Setiawan and Nupus (2021) analysed the effect of capital adequacy ratio and loan to deposit ratio on banking performance. The result found that capital adequacy ratio (CAR) and loan to deposit ratio (LDR) have positive and significant influence on the performance in State Owned Banks. However, asset size has a positive and significant impact on performance in foreign bank. Likewise, Agustiningrum (2013) analysed the impacts of non-performing loans (NPL) and loan to deposit ratio (LDR) towards performance. The study showed that loan to deposit ratio has a positive and significant impact on performance. In contrast, Ahmad *et al.* (2012) revealed that loan to deposit ratio has a negative and significant impact on the performance.

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. In order to create a sound and healthy financial system, wise and efficient regulation is important. Currently, the banking industry as an intermediary institution is the industry that has experienced the most rapid development, both in terms of business volume, mobilization of public funds and lending. Profitability is defined as an ability to make profit from all the business activities of an enterprise (Owolabi and Obida, 2012). Bank profitability is an important ingredient of financial development, its relevance spans through banking firm performance to macroeconomic stability. The economic development and financial growth of a country is critically dependent on the financial performance and strength of its banking sector (Shukla, 2015). 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. Further, 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).

Safitri and Oktavia (2022) analysed 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 modelling. 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) analysed 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 impact of capital structure, firm size, sales growth, and asset tangibility on profitability 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 impact of capital structure, firm size, sales growth, and asset tangibility on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size 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 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. 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 Bank			
1	Nepal Bank Limited	2016/17-2022/23	7
2	Rastriya Banijya Bank Limited		
Joint Venture Banks			
3	Himalayan Bank Limited	2016/17-2022/23	7
4	Everest Bank Limited	2016/17-2022/23	7
5	NMB Bank Limited	2016/17-2022/23	7
Private Banks			
6	Nabil Bank Limited	2016/17-2022/23	7
7	Standard Chartered Bank Limited	2016/17-2022/23	7
8	Nepal SBI Bank Limited	2016/17-2022/23	7
9	Machhapuchchhre Bank Limited	2016/17-2022/23	7
10	NIC Asia Bank Limited	2016/17-2022/23	7
11	Sanima Bank Limited	2016/17-2022/23	7
12	Siddhartha Bank Limited	2016/17-2022/23	7
13	Global IME Bank Limited	2016/17-2022/23	7
14	Prime Commercial Bank Limited	2016/17-2022/23	7
15	Citizens International Bank 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 profitability depends upon capital structure, firm size, sales growth, and asset tangibility. The dependent variables selected for the study are return on equity, net interest margin, and return on assets. Similarly, the selected independent variables are debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 \text{FSIZE} + \beta_2 \text{SG} + \beta_3 \text{AT} + \beta_4 \text{DSCR} + \beta_5 \text{DAR} + \beta_6 \text{DER} + e_{it}$$

$$ROE = \beta_0 + \beta_1 \text{FSIZE} + \beta_2 \text{SG} + \beta_3 \text{AT} + \beta_4 \text{DSCR} + \beta_5 \text{DAR} + \beta_6 \text{DER} + e_{it}$$

$$\text{NIM} = \beta_0 + \beta_1 \text{FSIZE} + \beta_2 \text{SG} + \beta_3 \text{AT} + \beta_4 \text{DSCR} + \beta_5 \text{DAR} + \beta_6 \text{DER} + e_{it}$$

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.

NIM = Net interest margin as measured by the ratio of net interest income to total assets, in percentage.

FSIZE = Firm size as measured by total assets, Rs. in billion.

SG = Sales growth as measured by the growth of loan and advances of commercial banks as compared to previous year, in percentage.

AT = Assets tangibility as measured by dividing the tangible assets (deducting goodwill and intangible assets from total assets) by total assets, Rs. in million.

DSCR = Debt coverage ratio as measured by the ratio of net operating income to current debt obligations, in percentage.

DAR = Debt to assets ratio as measured by the ratio of total debt to total assets, in percentage.

DER = Debt to equity ratio as measured by the ratio of total debt to total equity, in percentage.

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

Assets tangibility

Musah *et al.* (2019) described tangible assets as physical items of value that are not subject to sale for its customers and are used to generate income. Liberti and Sturgess (2016) discovered that tangible assets offering high guarantee are pledged as the primary source of collateral in corporate borrowing and play an important role in a firm's access to external finance, due to their relatively low asymmetry of information in valuation and high recovery rates. Likewise, Shleifer and Vishny (1992) argued that liquid assets, those that can be resold at attractive terms are good candidates for debt finance because financial distress for firms with such assets relatively inexpensive and profitable. The results also depicted that asset sales are an effective way in which firms can generate cash fast, pay off some debt and reduce leverage. Based on it this study develops the following hypothesis:

H₁: There is a positive relationship between assets tangibility and profitability.

Debt service coverage ratio

Ufo and Sudo (2015) stated that it is not uncommon to see manufacturing firms struggling to turnaround from their financial distress. Susanti (2022) examined the effect of efficiency (ROS) and debt coverage (DSCR) on capital structure (DR) and its impact on profitability. The results showed that efficiency has a positive relationship with the capital structure. Similarly, Macek *et al.* (2005) investigated the efforts of the Massachusetts Bay Transportation Authority (MBTA) in analysing the financial impact of building the Silver Line Phase III project on the Authority's existing capital and operating programs as part of the Federal Transit Administration (FTA) Section 5309 New Starts grant application process. The study showed that debt service coverage ratio has a positive impact on

financial performance. Likewise, Azka *et al.* (2021) analysed the financial distress analysis of delisted companies on Indonesian Stock exchange for period of 2013-2019. The findings serve to reduce the amount of risk of loss to investors by evaluating the Debt-Service Coverage Ratio (DSCR) as a reference to distinguish companies with good and bad financial health. Based on it this study develops the following hypothesis:

H₂: There is a positive relationship between debt to service coverage ratio and profitability.

Sales growth

Sales for banks is their credit products, hence this study uses increase in loans and advances of selected commercial banks as sales growth. Widarjo and Setiawan (2009) examined the effect of financial ratios on financial distress conditions in automotive companies. The study revealed that sales growth reflects the firm's ability over time either in distressed or non-distressed situation. The higher the level of sales growth of a firm, the firm is successful in executing its strategy. Similarly, Putri and Rahyuda (2020) assessed the effect of capital structure with the debt-to-equity ratio proxy, sales growth with sales growth proxy and profitability with return on asset proxy on firm value with direct and indirect price book value proxy using return on asset as a variable intervening. The results of the study showed that Sales Growth (SG) has a significant positive impact on return on assets. Muhanji and Ngari (2015) analysed the influence of integrated marketing communication and sales performance of commercial banks in Kenya. The study concluded that there is a positive relationship of advertising, personal selling, sales promotion, public relations, and direct marketing with sales performance of commercial banks. Based on it, this study develops following hypothesis:

H₃: There is a positive relationship between sales growth and profitability.

Debt to assets ratio

Yahya and Hidayat (2020) determined the effect of current ratio, total debt to total assets, total assets turnover, return on assets, on earnings persistence. The results showed that partial earnings persistence expressed in financial ratios consisting of the Return on Assets (ROA) significantly affect earnings persistence. Similarly, Chandra and Juliyawati (2020) determined the effects of solvability and activity on profitability of manufacturing companies in consumer goods subsector in Indonesia. The result showed that LTDTA has a significant but negative impact on return on assets. Likewise, Habib *et al.* (2016) indicated a significant but negative relationship between short term debt, long term debt, total debt, and return on assets. The study revealed a significant but negative relationship between debt and profitability. Further, Maria and Andiani (2021) analysed the effect of debt to asset ratio (DAR) and debt to equity ratio (DER) with price earnings ratio (PER) and profitability as measured by return on assets (ROA) as the mediating variable. The results of the analysis showed that DER has no direct impact on return on assets. The study also showed that debt to assets ratio has a significant and negative impact on return on assets. In addition, Abor (2005) investigated the relationship between capital structure and profitability of listed firms on the Ghana Stock Exchange (GSE) during a five-year period. The results revealed a significantly positive relationship between ratio of short-term debt to total assets and ROE. Based on it, this study develops following hypothesis:

H₄: There is a negative relationship between debt to assets ratio and profitability.

Total debt to total equity ratio

Ulzanah, and Murtaqi (2015) showed that earning per share, debt to equity ratio, and current ratio have significant impact on profitability measured by return on assets. Similarly, Siregar and Harahap (2021) determined the effect of current ratio, debt to equity ratio, and total assets turnover on return on equity in transportation sector companies listed on the Indonesia Stock Exchange. The study concluded that partially total assets turnover has a significant effect on return on equity, while current ratio, debt to equity ratio have positive effect on return on equity. Likewise, Amanda (2019) analysed the impact of cash turnover, receivable turnover, inventory turnover, current ratio and debt to equity ratio to profitability. The study showed that cash turnover has no impact to profitability, receivable turnover has no impact to profitability, inventory turnover has no impact to profitability, current ratio has a positive and significant impact to profitability, and debt to equity ratio has no impact on profitability. Further, Permada and Sari (2024) showed that current and debt-to-equity ratios significantly affect return on equity. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between debt to equity and profitability.

Firm size

Ramadhani and Wahjudi (2024) showed that firm size, leverage, and liquidity have no impact on firm value. Likewise, Hazmi (2024) analysed the impact of tax evasion, profitability, and firm size on firm value. The study stated that firm value is not affected by tax evasion, profitability influences firm value, and business size has no effect on firm value. Further, Akinyomi and Olagunju (2013) examined the effect of firm size on the profitability of Nigerian manufacturing sector. The study revealed that firm size, both in terms of total assets and in terms of total sales has a positive impact on profitability. In addition, Hutabarat (2024) investigated how green accounting practices, leverage (debt levels), and company size influence profitability and ultimately firm value. The study found that leverage (debt) and company size have a positive and statistically significant impact on profitability. Based on it, this study develops the following hypothesis:

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

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 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), and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are FSIZE (Firm size as measured by total assets, Rs. in billion), SG (Sales growth as measured by the growth of loan and advances of commercial banks as compared to previous year, in percentage), AT (Assets tangibility as measured by dividing the tangible assets (deducting goodwill and intangible assets from total assets) by total assets, Rs. in million), DSCR (Debt coverage ratio as measured by the ratio of net operating income to current debt obligations, in percentage), DAR (Debt to assets ratio as measured

by the ratio of total debt to total assets, in percentage), and DER (Debt to equity ratio as measured by the ratio of total debt to total equity, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	2.69	1.48	0.45
ROE	3.75	23.30	14.07	4.05
NIM	2.42	8.18	4.50	1.18
FSIZE	60.99	526.82	191.32	101.34
SG	-0.88	0.84	0.10	0.34
AT	0.99	1.00	0.99	0.02
DSCR	0.27	129.39	15.61	18.10
DER	0.82	15.57	8.39	2.06
DAR	0.09	0.94	0.86	0.12

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 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), and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are FSIZE (Firm size as measured by total assets, Rs. in billion), SG (Sales growth as measured by the growth of loan and advances of commercial banks as compared to previous year, in percentage), AT (Assets tangibility as measured by dividing the tangible assets (deducting goodwill and intangible assets from total assets) by total assets, Rs. in million), DSCR (Debt coverage ratio as measured by the ratio of net operating income to current debt obligations, in percentage), DAR (Debt to assets ratio as measured by the ratio of total debt to total assets, in percentage), and DER (Debt to equity ratio as measured by the ratio of total debt to total equity, in percentage).

Variables	ROA	ROE	NIM	FSIZE	SG	AT	DSCR	DER	DAR
ROA	1								
ROE	0.750**	1							
NIM	0.568**	0.561**	1						
FSIZE	-0.430**	-0.195*	-0.043	1					
SG	-0.270**	-0.149	-0.182	0.351**	1				
AT	0.312	-0.435	0.0111	0.087	-0.007	1			
DSCR	0.011	0.075	-0.267**	-0.143	-0.029	-0.16	1		
DER	-0.360**	0.229*	-0.029	0.347**	0.169	0.424**	0.06	1	
DAR	0.021	0.227*	0.058	-0.096	-0.014	0.145	-0.01	0.510**	1

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

Table 3 shows that firm size has a negative relationship with return on assets. It indicates that larger the firm size, lower would be the return on assets. Similarly, sales growth has a negative relationship with return on assets. It indicates that higher the sales growth, lower would be the return on assets. Likewise, assets tangibility has a positive relationship with return on assets. It indicates that increase in assets tangibility leads to increase in return on assets. Further, debt service coverage ratio has a positive relationship with return on assets. It indicates that increase in debt service coverage ratio leads to increase in return on assets. In addition, debt to equity ratio has a negative relationship with return on assets. It indicates that higher the debt to equity ratio, lower would be the return on assets. In contrast, debt to assets ratio has a positive relationship with return on assets. It indicates that increase in debt to assets ratio leads to increase in return on assets.

Similarly, the result also shows that firm size has a negative relationship with return on equity. It indicates that larger the firm size, lower would be the return on equity. Similarly, sales growth has a negative relationship with return on equity. It indicates that higher the sales growth, lower would be the return on equity. Likewise, assets tangibility has a negative relationship with return on equity. It indicates that increase in assets tangibility leads to decrease in return on equity. Further, debt service coverage ratio has a positive relationship with return on equity. It indicates that increase in debt service coverage ratio leads to increase in return on equity. In addition, debt to equity ratio has a positive relationship with return on equity. It indicates that higher the debt to equity ratio, higher would be the return on equity. Moreover, debt to assets ratio has a positive relationship with return on equity. It indicates that increase in debt to assets ratio leads to increase in return on equity.

Likewise, the study also shows that firm size has a negative relationship with net interest margin. It indicates that larger the firm size, lower would be the net interest margin. Similarly, sales growth has a negative relationship with net interest margin. It indicates that higher the sales growth, lower would be the net interest margin. Likewise, assets tangibility has a positive relationship with net interest margin. It indicates that increase in assets tangibility leads to increase in net interest margin. Further, debt service coverage ratio has a negative relationship with net interest margin. It indicates that increase in debt service coverage ratio leads to decrease in net interest margin. In addition, debt to equity ratio has a negative relationship with net interest margin. It indicates that higher the debt to equity ratio, lower would be the net interest margin. Moreover, debt to assets ratio has a positive relationship with net interest margin. It indicates that increase in debt to assets ratio leads to increase in 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, 5 and 6. More specifically, Table 4 shows the regression results of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size with return on assets of Nepalese commercial banks

Table 4

Estimated regression results of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size on return on assets

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2016/17 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 FSIZE + \beta_2 SG + \beta_3 AT + \beta_4 DSCR + \beta_5 DAR + \beta_6 DER + e_{it}$ 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 FSIZE (Firm size as measured by total assets, Rs. in billion), SG (Sales growth as measured

by the growth of loan and advances of commercial banks as compared to previous year, in percentage), AT (Assets tangibility as measured by dividing the tangible assets (deducting goodwill and intangible assets from total assets) by total assets, Rs. in million), DSCR (Debt coverage ratio as measured by the ratio of net operating income to current debt obligations, in percentage), DAR (Debt to assets ratio as measured by the ratio of total debt to total assets, in percentage), and DER (Debt to equity ratio as measured by the ratio of total debt to total equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		FSize	SG	AT	DSCR	DER	DAR			
1	1.848 (21.824)**	-0.002 (4.829)**						0.177	0.404	23.31
2	1.523 (34.56)**		-0.270 (2.89)**					0.064	0.431	8.117
3	-5.336 (0.250)			6.829 (0.129)				0.158	0.409	20.561
4	1.482 (25.616)**				0.011 (0.109)			0.010	0.447	0.012
5	2.141 (12.451)**					-0.078 (3.921)**		0.121	0.417	15.37
6	1.415 (4.272)**						0.082 (0.216)	0.009	0.447	0.047
7	1.826 (21.037)**	-0.002 (4.039)**	-0.180 (1.441)					0.185	0.402	12.818
8	12.106 (0.626)	-0.002 (4.080)**	-0.176 (1.406)	13.952 (0.720)				0.177	0.404	8.461
9	12.191 (0.628)	-0.002 (4.102)**	-0.174 (1.388)	14.062 (0.724)	0.001 (0.548)			0.171	0.405	6.374
10	11.256 (0.594)	-0.001 (3.178)**	-0.159 (1.295)	13.465 (0.710)	0.001 (0.270)	-0.050 (2.461)*		0.216	0.395	6.734
11	11.292 (0.600)	-0.001 (2.503)*	-0.157 (1.288)	13.089 (0.695)	0.000 (0.094)	-0.072 (2.907)**	0.634 (1.535)	0.226	0.393	6.058

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 firm size are negative with return on assets. It indicates that firm size has a negative impact on return on assets. This finding contradicts with the findings of Hutabarat (2024). Similarly, the beta coefficients for sales growth are negative with return on assets. It indicates that sales growth has a negative impact on return on assets. This finding is inconsistent with the findings of Widarjo and Setiawan (2009). Likewise, the beta coefficients for assets tangibility are positive with return on assets. It indicates that assets tangibility has a positive impact on return on assets. This finding is consistent with the findings of Shleifer and Vishny (1992). In addition, the beta coefficients for debt service coverage ratio are positive with return on assets. It indicates that debt service coverage ratio has a positive impact on return on assets. This finding is consistent with the findings of Susanti (2022). Further, 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 similar to the findings of Siregar and Harahap (2021). However, the beta coefficients for debt to assets ratio are positive with return on assets. It indicates that debt to assets ratio has a positive impact on return on assets. This finding is similar to the findings of Yahya and Hidayat (2020).

Table 5 shows the estimated regression results of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size on return on equity

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2016/17 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 FSIZE + \beta_2 SG + \beta_3 AT + \beta_4 DSCR + \beta_5 DAR + \beta_6 DER + e_{it}$ 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 FSIZE (Firm size as measured by total assets, Rs. in billion), SG (Sales growth as measured by the growth of loan and advances of commercial banks as compared to previous year, in percentage), AT (Assets tangibility as measured by dividing the tangible assets (deducting goodwill and intangible assets from total assets) by total assets, Rs. in million), DSCR (Debt coverage ratio as measured by the ratio of net operating income to current debt obligations, in percentage), DAR (Debt to assets ratio as measured by the ratio of total debt to total assets, in percentage), and DER (Debt to equity ratio as measured by the ratio of total debt to total equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		FSIZE	SG	AT	DSCR	DER	DAR			
1	15.561 (18.644)**	-0.008 (2.015)*						0.029	3.98	4.061
2	14.259 (34.716)**		-1.789 (1.532)					0.013	4.02	2.347
3	98.102 (0.506)			-84.115 (0.433)				0.008	4.06	1.88
4	13.811 (26.377)**				0.017 (0.764)			0.004	4.05	0.583
5	10.302 (6.325)**					0.449 (2.383)*		0.043	3.95	5.67
6	7.204 (2.460)*						7.926 (2.366)*	0.042	3.95	5.59
7	15.428 (18.182)**	-0.006 (1.571)	-1.105 (0.893)					0.027	3.99	2.43
8	73.507 (0.382)	-0.006 (1.528)	-1.120 (0.929)	-58.159 (0.302)				0.018	4.01	1.63
9	74.298 (0.385)	-0.006 (1.435)	-1.135 (0.909)	-59.185 (0.306)	0.011 (0.513)			0.111	4.02	1.28
10	61.716 (0.336)	-0.011 (2.537)**	-1.342 (1.129)	-51.162 (0.279)	0.003 (0.137)	0.670 (3.419)**		0.106	3.8	3.47
11	61.637 (0.335)	-0.010 (2.267)*	-1.338 (1.120)	-51.986 (0.282)	0.004 (0.175)	0.621 (2.548)**	1.386 (0.343)	0.098	3.81	3.17

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 firm size are negative with return on equity. It indicates that firm size has a negative impact on return on equity. This finding contradicts with the findings of Hazmi (2024). Similarly, the beta coefficients for sales growth are negative with return on equity. It indicates that sales growth has a negative impact on return on equity. This finding contradicts with the findings of Putri and Rahyuda (2020). Likewise, the beta coefficients for assets tangibility are negative with return on equity. It indicates that assets tangibility has a negative impact on return on equity. This finding is consistent with the findings of Musah *et al.* (2019). In addition, the beta coefficients for debt service coverage ratio are positive with return on equity. It indicates that debt service coverage ratio has a positive impact on return on equity. This finding is consistent with the findings of Azka *et al.* (2021). Further, the beta coefficients for debt to equity ratio are positive with return on equity. It indicates that debt to equity ratio has a positive impact on return on equity. This finding is similar to the findings of Permada and Sari (2024). However, the beta coefficients for debt to assets ratio are positive with return on equity. It indicates that debt to assets ratio has a positive impact

on return on equity. This finding is similar to the findings of Abor (2005).

Table 6 shows the estimated regression results of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility and firm size on net interest margin of Nepalese commercial banks.

Table 6

Estimated regression results of debt to equity ratio, debt to assets ratio, debt service coverage ratio, sales growth, assets tangibility, and firm size on net interest margin

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2016/17 to 2022/23 by using the linear regression model and the model is $NIM = \beta_0 + \beta_1 FSIZE + \beta_2 SG + \beta_3 AT + \beta_4 DSCR + \beta_5 DAR + \beta_6 DER + e_{it}$ where, the dependent variable is NIM (NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are FSIZE (Firm size as measured by total assets, Rs. in billion), SG (Sales growth as measured by the growth of loan and advances of commercial banks as compared to previous year, in percentage), AT (Assets tangibility as measured by dividing the tangible assets (deducting goodwill and intangible assets from total assets) by total assets, Rs. in million), DSCR (Debt coverage ratio as measured by the ratio of net operating income to current debt obligations, in percentage), DAR (Debt to assets ratio as measured by the ratio of total debt to total assets, in percentage), and DER (Debt to equity ratio as measured by the ratio of total debt to total equity, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		FSIZE	SG	AT	DSCR	DER	DAR			
1	4.605 (18.622)**	-0.001 (0.441)						0.008	1.18	0.194
2	4.574 (38.499)**		-0.633 (1.875)					0.024	1.16	3.51
3	-59.352 (1.058)			63.926 (1.138)				0.003	1.17	1.296
4	4.779 (32.468)**				-0.017 (2.809)**			0.062	0.1.13	7.891
5	4.648 (9.556)**					-0.017 (0.297)		-0.009	1.18	0.088
6	3.997 (4.578)**						0.589 (0.590)	-0.006	1.18	0.348
7	4.525 (18.221)**	0.000 (0.224)	-0.662 (1.826)					0.015	1.16	1.76
8	-57.922 (1.035)	-0.001 (0.116)	-0.645 (1.781)	62.534 (1.116)				0.017	1.167	1.595
9	-59.176 (1.096)	-0.001 (0.293)	-0.621 (1.777)	64.161 (1.187)	-0.018 (2.909)**			0.085	1.12	3.4
10	-59.497 (1.097)	-0.001 (0.372)	-0.627 (1.782)	64.365 (1.185)	-0.018 (2.910)**	0.017 (0.295)		0.76	1.13	2.71
11	-59.528 (1.093)	-0.001 (0.198)	-0.625 (1.770)	64.045 (1.174)	-0.018 (2.827)**	-0.002 (0.028)	0.539 (0.451)	0.069	1.13	2.27

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. Net interest margin is the dependent variable.

Table 6 shows that the beta coefficients for firm size are negative with net interest margin. It indicates that firm size has a negative impact on net interest margin. This finding is similar to the findings of Ramadhani and Wahjudi (2024). Similarly, the beta coefficients for sales growth are negative with net interest margin. It indicates that sales growth has a negative impact on net interest margin. This finding contradicts with the findings of Muhanji and Ngari (2015). Likewise, the beta coefficients for assets tangibility are positive with net interest margin. It indicates that assets tangibility has a positive impact on net interest margin. This finding is consistent with the findings of Liberti and Sturgess (2016).

In addition, the beta coefficients for debt service coverage ratio are negative with net interest margin. It indicates that debt service coverage ratio has a negative impact on net interest margin. This finding is consistent with the findings of Macek *et al.* (2005). Further, the beta coefficients for debt to equity ratio are negative with net interest margin. It indicates that debt to equity ratio has a negative impact on net interest margin. This finding contradicts with the findings of Ulzanah, and Murtaqi (2015). However, the beta coefficients for debt to assets ratio are positive with net interest margin. It indicates that debt to assets ratio has a positive impact on net interest margin. This finding contradicts with the findings of Chandra and Juliyawati (2020).

4. Summary and conclusion

The banking sector is thought to be one of the main economic sectors that is essential to the growth of the country. The next stage of the economy's expansion is determined by the banking sector's dedication to development. Therefore, an economy's potential to grow depends on the stability of the financial sector. A strong banking system promotes. Trade of products and services is facilitated by investment because it makes it easier to finance profitable company ventures, mobilise savings, and allocate resources efficiently. One of the most crucial decisions that financial managers make in the modern day is the choice of capital structure. Many additional company finance considerations revolve upon the choice of capital structure. The banking system is essential to the expansion of an economy, and capital ratios play a major part in prudential regulation, which aids in understanding the variables that influence banks' decisions about their capital structure. Bank profitability is influenced by a number of internal and external factors. It also depends on the state of the economy or industry.

This study attempts to analyse the impact of capital structure, firm size, assets tangibility and sales growth on profitability 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 firm size, and sales growth have negative impact on profitability. Similarly, assets tangibility has a positive impact on return on assets and net interest margin. It indicates that increase in assets tangibility leads to increase in return on assets and net interest margin. However, assets tangibility has a negative impact on return on equity. Similarly, debt service coverage ratio has a positive impact on return on assets and return on equity. In contrast, debt service coverage ratio has a negative impact on net interest margin. Likewise, debt to equity ratio has a negative impact on return on assets and net interest margin. However, debt to equity ratio has a positive impact on return on equity. In contrast, debt to assets ratio has a positive impact on profitability of banks. Likewise, the study also concluded that assets tangibility followed by debt to assets ratio is the most influencing factor that explains the changes in the return on asset and net interest margin in the context of Nepalese commercial banks. Similarly, 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 return on equity in context of Nepalese commercial banks.

References

- 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), 438-445.
- 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, 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.
- Akinyomi, O. J., and A. Olagunju, 2013. Effect of firm size on profitability. *Prime Journal of Business Administration and Management* 3(9), 1171-1175
- 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.
- Amanda, R. I., 2019. The impact of cash turnover, receivable turnover, inventory turnover, current ratio and debt to equity ratio on profitability. *Journal of Research in Management* 2(2), 14-22.
- 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.
- Azka, R., A. N. Azam, and A. Trias, 2021. Financial distress analysis of delisted companies on Indonesian stock exchange for period of 2013-2019. *Russian Journal of Agricultural and Socio-Economic Sciences* 119(11), 11-18.
- 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.
- Chandra, S., and C. Juliawati, 2020. Effects of long term debt to total assets, short term debt to total assets, total asset turnover, and inventory turnover on profitability of manufacturing companies in consumer goods subsector listed on IDX. *Journal of Applied Business and Technology* 1(3), 212-222.
- 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.
- 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.
- Das, A., and S. Ghosh, 2013. Determinants of credit risk in Indian state-owned banks: An empirical investigation. MPRA Paper, 1-21.
- 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.
- 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.

- Habib, H., F. Khan, and M. Wazir, 2016. Impact of debt on profitability of firms: Evidence from non-financial sector of Pakistan. *City University Research Journal* 6(1), 70-80.
- 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.
- Hazmi, R. A., 2024. The effect of tax avoidance, profitability, and firm size on firm value (case study of pharmaceutical companies listed on the IDX 2018-2022). *Educoretax* 4(2), 159-170.
- Hutabarat, F., 2024. Effect of green accounting, leverage, firm size on firm value with profitability as intervening variable. *International Journal of Professional Business Review* 9(4), 1-25.
- Jaouad, E., and O. Lahsen, 2018. Factors affecting bank performance: An empirical evidence from Morocco. *European Scientific Journal* 14(34), 255-267.
- Khatri, 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.
- 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.
- Maria, E., and L. Andiani, 2021. Debt to total asset ratio, debt to equity ratio, and company's value with return on assets as meditation. *Jurnal Manajemen Dan Bisnis* 10(1), 84-92.
- 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.
- 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.
- Mohiuddin, G. 2014. Use of CAMEL model: A study on the financial performance of selected commercial banks in Bangladesh. *Universal Journal of Accounting and Finance* 2(5), 51-160.
- Muhanji, E. M., and M. B. Ngari, 2015. Influence of integrated marketing communication and sales performance of commercial banks in Kenya. *International Journal of Scientific and Research Publications* 5(9), 1-20.
- Musah, M., Y. Kong, and A. A. Osei, 2019. The nexus between asset tangibility and firms' financial performance: A panel study of non-financial firms listed on the Ghana Stock Exchange (GSE). *European Academic Research* 12(1), 450-474.
- Neupane, B. P., 2020. Performance determinants of Nepalese commercial banks. *Press Academia Procedia* 12(5), 40-45.
- Osuagwu, E., 2014. Determinants of bank profitability in Nigeria. *International Journal of Economics and Finance* 6(12), 46-63.
- Owolabi, S. A., and S. S. Obida, 2012. Liquidity management and corporate profitability: case study of selected manufacturing. *Business Management Dynamics* 2(2), 10-25.
- Permada, D. N. R., and P. Sari, 2024. The effect of current ratio and debt to equity ratio on return on equity at PT.

- Timah Tbk. *Journal of Economics and Business Letters* 4(1), 43-53.
- Putri, I. G. A. P. T., and H. Rahyuda, 2020. Effect of capital structure and sales growth on firm value with profitability as mediation. *International Research Journal of Management, IT and Social Sciences* 7(1), 145-155.
- 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.
- 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.
- Ramadhani, B. N., and E. Wahjudi, 2024. The effect of firm size, leverage, liquidity and profitability on firm value: (empirical study on food and beverage subsector manufacturing companies listed on the IDX for the 2018–2021 period). *Jurnal Penelitian Ekonomi Dan Akuntansi* 9(1), 179-193.
- 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, 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.
- Samad, A., 2015. Determinants financial performance: Empirical evidence from Bangladesh commercial banks. *International Journal of Financial Research* 6(3), 173-179.
- 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.
- Shleifer, A., and R. W. Vishny, 1992. Liquidation values and debt capacity: A market equilibrium approach. *The Journal of Finance* 47(4), 1343-1366.
- Shukla, S. S., 2015. Analysing financial strength of public and private sector banks: A CAMEL Approach. *Pacific Business Review International* 7(8), 44-50.
- 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.
- Siregar, S. K., D. Harahap, and R. H. Lubis, 2021. Peran dana zakat produktif dalam meningkatkan pendapatan mustahik. *Journal of Islamic Social Finance Management* 2(2), 225-236.
- 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.
- Susanti, M., 2022. ROS, DR and DSCR. *8ISC Proceedings: Business* 1(2), 129-135.
- 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 (AJHSSR)* 5(1), 651-656.

- Tarek Al-Kayed, L., Z. S. Raihan, and J. Duasa, 2014. The relationship between capital structure and performance of Islamic banks. *Journal of Islamic Accounting and Business Research* 5(2), 158-181.
- Ufo, A., A. No, and W. Sodo, 2015. Determinants of financial distress in manufacturing firms of Ethiopia. *Research Journal of Finance and Accounting* 6(17), 9-17.
- Ulzanah, A. A., and I. Murtaqi, 2015. The impact of earnings per share, debt to equity ratio, and current ratio towards the profitability of companies listed in LQ45 from 2009 to 2013. *Journal of Business and Management* 4(1), 18-27.
- 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.
- Widarjo, W., and D. Setiawan, 2009. The effect of financial ratios on financial distress conditions in automotive companies. *Jurnal Bisnis dan Akuntans* 11(2), 107-119.
- 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.
- Yahya, A., and S. Hidayat, 2020. The influence of current ratio, total debt to total assets, total assets turn over, and return on assets on earnings persistence in automotive companies. *Journal of Accounting Auditing and Business* 3(1), 62-72.

Chapter 9

Impact of Gender Diversity, Net Interest Margin, Loan to Deposit Ratio and Operating Efficiency on Profitability of Nepalese Commercial Banks

Monika Bhatta*

Abstract

This study examines the impact of gender diversity, net interest margin, loan to deposit ratio and operating efficiency on profitability of Nepalese commercial banks. Return on assets (ROA) and return on equity (ROE) are the selected dependent variables. The selected independent variables are capital adequacy ratio, board size, net interest margin, loan to deposit ratio, operating efficiency and gender diversity. 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 gender diversity, net interest margin, loan to deposit ratio and operating efficiency on the profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact on return on assets return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on assets and return on equity. Similarly, board size has a positive impact on return on assets return on equity. It indicates that increase in board size leads to increase in return on assets and return on equity. Likewise, net interest margin has a positive impact on return on assets return on equity. It indicates that increase in net interest margin leads to increase in return on assets and return on equity. In contrast, 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. In addition, operating efficiency has a positive impact on return on assets and return on equity. It indicates that increase in operating efficiency leads to increase in return on assets and return on equity. Moreover, gender diversity has a negative impact on return on assets and return on equity. It means that increase in proportion of female directors on board leads to decrease in return on assets and return on equity.

Keywords: capital adequacy ratio, board size, net interest margin, loan to deposit ratio, operating efficiency, gender diversity, return on assets, return on equity

1. Introduction

Commercial banks are widely recognized as the most prominent agencies in the credit market playing a significant role in the direction of an economy. A sound, profitable, competent and well managed banks enable both the economy and the country to stay competitive and able to withstand any negative shocks (Jamal *et al.*, 2012). Commercial banks are the main pillar of the financial system as it provides different opportunity and services to clients. The importance of the banking sectors is immense in the progress and richness of any state. The economic development and prosperity come from the well-rounded developed and perfect banking system (Tariq *et al.*, 2014). Commercial banks are the major source of credit for business firms and households in many countries (Rose and Spiegel, 2012). Commercial banks play a vital role in each country's economy, since growth can be achieved if the savings are effectively channeled for investments and the failure to involve the banking system is often defined as the main weakness of the centralized planned economy (Erina and Lace, 2013).

* Ms. Bhatta is a Freelance Researcher, Kathmandu, Nepal.

Chishty (2011) argued that capital adequacy is important for a bank to maintain depositor's confidence and presenting bank from going bankrupt. Capital is seen as a strong support to protect depositors and promote the stability and efficiency of financial system around the world. Capital adequacy reflects the overall financial conditions of the bank and also the ability of the management to meet the need for additional capital. It also indicates whether the bank has enough capital to absorb unexpected loss. It also acts as indicators of bank leverage. Capital adequacy measure the financial strength of the financial institution. Measuring a bank's profitability, net interest margin (NIM) is the most commonly used measure in these studies, due to the importance of interest income and interest expense, since they are the main traditional function of banks' major operations, and for the substantial amount of their operating income. Loan-to-deposit ratio (LDR) is the proportion of loan-assets created by banks from the deposits received. Loan-to-deposit ratio shows that the efficiency with which the commercial and financial intermediaries are tapping savings from the available sources and channelizing these to various productive activities of the economy. An assessment of credit- deposit ratio would assist the policy makers to prepare policies for recovering concert of these institutions (Mittal and Dhade, 2007).

Shuremo (2016) found that if a bank effectively manages its operating expenses and keeps them low, it can improve its profitability. By reducing costs, banks can increase their operating income and, ultimately, their net profit. This can be achieved through various means, such as optimizing operational processes, negotiating better deals with suppliers, or implementing cost-saving measures (Sapa and Awaluddin, 2022). Banks must strike a balance between managing operating expenses and providing quality services to customers. While reducing expenses is beneficial, it should not come at the expense of customer satisfaction or the bank's ability to compete in the market. So, operating expenses have a direct impact on the profitability of banks. By effectively managing these expenses, banks can improve their financial performance and enhance their overall profitability. Rajindra (2021) examined the effect of operating costs and income, loan to deposit ratio on the return on assets of public-private foreign exchange banks listed on the Indonesia stock exchange during the 2015-2018 period. The study revealed that the loan-to-deposit ratio had a positive and insignificant effect on return on assets.

Liyana and Indrayani (2020) investigated the effect of loan-to-deposit ratio, and net interest margin on 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 profitability 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. 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 profitability. The result found that capital adequacy ratio (CAR) and loan to deposit ratio (LDR) have a positive and significant influence on the profitability in State Owned Banks. However, only asset size has positive and significant effect on profitability in foreign bank. Similarly, Agustiningrum (2013) analyzed loan to deposit ratio (LDR) towards profitability. The study showed that loan to deposit ratio has a positive and significant effect on profitability. In contrast, Ahmad *et al.* (2012) revealed that loan-to-deposit ratio has a negative and significant effects on the profitability.

Brastama and Yadnya (2020) analyzed the effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable. The results found that capital adequacy ratio has a positive effect on return on assets. Likewise, 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 effect on return on assets. Similarly, Solihati (2020) analyzed the factors affecting banking profitability. The results revealed that non-performing loan and capital adequacy ratio have significant effect on return on assets (ROA). Moreover, Utu (2019) examined the 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 effects on return on assets (ROA). Surtikanti *et al.* (2022) examined the influence of capital adequacy ratio and net interest margin on profitability (Return on Asset) in listed Foreign Exchange Commercial Banks in Indonesia Stock Exchange from 2011 to 2015. The results indicated that capital adequacy ratio significantly influence the profitability while net interest margin has significantly positive influence on profitability (Return on asset). John *et al.* (2014) revealed that the presence of female director on the board has a positive but insignificant relationship with banks' profitability. Similarly, the result showed that the proportion of female in the board of directors has a positive but insignificant relationship with profitability in Nigeria. Noland *et al.* (2016) suggested that the presence of women in corporate leadership positions may improve firm performance.

In the context of Nepal, Pradhan and Shrestha (2016) examined the impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. The study showed that total deposits to total assets and banks operating efficiency are the major variables determinant of financial performance of commercial banks in Nepal. Bank operating efficiency, loan ratio, total deposit to total assets and loan loss provision to total equity have a significantly positive impact on financial performance of commercial banks. However, Karki (2004) found that there is a positive relationship between capital adequacy and profitability. Jha *et al.* (2012) investigated the impact of capital adequacy ratio, interest expenses to total loan, net interest margin ratio and credit to deposit ratio on the financial profitability namely return on assets and return on equity of these banks. The results revealed that return on assets was significantly influenced by capital adequacy ratio, interest expenses to total loan and net interest margin, while capital adequacy ratio had considerable effect on return on equity. Panta (2019) investigated impact of credit risk management on bank performance. The study concluded that default rate and cost per loan asset were the significant variables explaining the banks' performance. However, capital adequacy ratio was insignificant for the banks' performance. Gautam (2018) examined the determinants of financial performance of commercial bank in Nepal. The study revealed a positive relationship of return on assets with capital adequacy ratio, management efficiency and gross domestic product whereas negative with assets quality and liquidity management. Chaudhary *et al.* (2017) analyzed the impact of corporate governance on firm performance. The study showed that board size, number of board meeting, size of firm has a positive impact on firm performance.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the effect of gender diversity, net interest margin, loan to deposit ratio and operating efficiency on bank 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 the study is to examine the effect of gender diversity, net interest margin, loan to deposit ratio and operating efficiency on profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, board size, net interest margin, loan to deposit ratio, operating efficiency and gender diversity 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 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), 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	Observation
Public banks			
1	Nepal Bank Limited	2014/15-2022/23	9
2	Rastriya Banijya Bank Limited	2014/15-2022/23	9
Joint venture banks			
3	Himalayan Bank Limited	2014/15-2022/23	9
4	Everest Bank Limited	2014/15-2022/23	9
5	NMB Bank Limited	2014/15-2022/23	9
6	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
7	Nepal SBI Bank Limited		
Private banks			
8	Citizens International Bank Limited	2014/15-2022/23	9
9	Machhapuchchhre Bank Limited	2014/15-2022/23	9
10	Sanima Bank Limited	2014/15-2022/23	9
11	Siddhartha Bank Limited	2014/15-2022/23	9
12	Prime Commercial Bank Limited	2014/15-2022/23	9
Total number of observations			108

Source: Annual reports

Thus, the study is based on 108 observations.

The model

The model used in this study assumes that profitability of banks depends upon gender diversity, net interest margin, loan to deposit ratio and operating efficiency. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are capital adequacy ratio, board size, net interest margin, loan to deposit ratio, operating efficiency and gender diversity. Therefore, the models take the following forms

$$ROA = \beta_0 + \beta_1 CAR + \beta_2 BS + \beta_3 NIM + \beta_4 LDR + \beta_5 OE + \beta_6 GD + e_{it}$$

$$ROE = \beta_0 + \beta_1 CAR + \beta_2 BS + \beta_3 NIM + \beta_4 LDR + \beta_5 OE + \beta_6 GD + e_{it}$$

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.

BS = Board size as measured by the number of board members, in numbers.

NIM = Net interest margin as measured by the ratio of net interest income to total assets, in percentage.

LTD = Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

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

GD = Gender diversity as measured by the number of females in the board as a director, in numbers.

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

Capital adequacy ratio

Capital adequacy ratio is measured as the summation of primary and supplementary capital divided by risk weighted assets. Kumar *et al.* (2020) investigated the relationship between monetary policy and banks' profitability in New Zealand. The study revealed that capital adequacy ratio is positively related to return on assets. Similarly, Almumani (2013) showed a positive relationship between capital adequacy ratio and profitability of Jordanian banks. Likewise, Ariwidanta and Wiksuana (2018) determined the relationship between credit and liquidity risk to profitability through the capital adequacy ratio as a mediating variable. The study concluded that capital adequacy ratio is positively related to return on assets. Further, Widyastuti *et al.* (2017) found that capital adequacy ratio positively influences profitability. In addition, Alzoubi (2018) concluded a positive relationship between capital adequacy ratio and profitability of banks measured by return on assets. Handayani *et al.* (2019) analyzed the determinants of Islamic commercial banks' profitability 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 profitability. Farkasdi *et al.* (2021) determined the determinants of profitability in commercial banks in Germany. The study showed a positive relationship between capital adequacy ratio and profitability measured by return on equity. Likewise, Olalekan and Adeyinka (2013) found a positive relationship between capital adequacy ratio and profitability of Nigerian banks. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and banks' profitability.

Board size

Andres and Vallelado (2008) showed an inverted U-shaped relationship between bank performance and board size. Smaller boards tend to be more agile and can make decisions faster, which can be beneficial in the fast-paced banking industry. Further, Jensen (1993) argued that when board size increase above seven or eight, the efficiency of board decreases and CEO of the company lose control on the board. In addition, Staikouras (2007) revealed that board size is negatively correlated to bank performance, while board composition has no impact on bank performance. As the number of board members increases, the complexity of coordination and communication also rises. This can result in inefficiencies and misunderstandings, potentially leading to less effective governance. Moreover, Chahine and Safieddine (2011) found that board size is negatively related to bank performance. Guest (2009) revealed that there is strong negative impact of board size on financial sustainability measured

by ROA, Tobin's Q and share returns. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between board size and banks' profitability.

Net interest margin

NIM is measured by comparing net interest income to earning assets. The greater the NIM, the higher the interest income on earning assets managed by the bank. Puspitasari *et al.* (2021) examined the factors that affect the return on assets (ROA) by placing net interest margin (NIM) as a moderating variable in influencing ROA. The study concluded that LDR will increase the ROA at banks that generate high NIM. Similarly, Le *et al.* (2022) found that net interest margin has a positive and significant effect on profitability. Banks with a higher NIM often have greater pricing power in their lending activities, allowing them to charge higher rates on loans while keeping their funding costs relatively low. Likewise, Marlina (2022) concluded that NIM has a positive and insignificant effect on ROA. Further, Sukmadewi (2020) stated that net interest margin has a positive and significant effect on return on assets. In addition, Widyakto *et al.* (2021) revealed that NIM incorporates a critical positive impact on ROE. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between net interest margin and banks' profitability.

Loan-to-deposit ratio

Loan to deposit ratio is measured as the ratio of total loan provided by the banks out of the deposit collected. Mehta and Bhavani (2017) examined the variables that impact the profitability of UAE banks. The study showed that credit to deposit ratio is negatively related to return on assets and return on equity. Similarly, Chowdhury and Zaman (2018) found that credit to deposit ratio has a negative relationship with return on assets and return on equity. Likewise, Purbaningsih and Fatimah (2014) revealed that credit to deposit ratio is negatively related to return on assets. Further, Suroso (2022) identified that loan to deposit ratio has a negative effect on profitability. In addition, Yigermal (2017) analyzed the impact of bank specific and macro-economic factors on the profitability of selected Ethiopian private commercial banks. The study concluded that credit to deposit ratio is negatively related to profitability. Similarly, Golubeva *et al.* (2019) showed that credit to deposit ratio has a negative relationship with return on equity. Further, Mohanty and Krishnankutty (2018) showed that return on asset has a negative and significant relationship with credit to deposit ratio. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between loan to deposit ratio and banks' profitability.

Operating efficiency

Operating efficiency reflects how well a bank manages its expenses relative to its income. When a bank operates efficiently, it can minimize costs while maximizing revenue, leading to increased profitability (Boateng, 2019). Mehzabin *et al.* (2023) found that there is a significant and positive effect of capital structure, operating efficiency and non-interest income on banks' profitability in the context of Asia. Similarly, Buchory (2015) found a positive association between operating efficiency and banks' profitability. Likewise, Oral and Yolalan (1990) revealed a direct positive relationship between operating efficiency and banks' profitability. Further, Bashir (2003) showed a positive relationship between operational efficiency and banks' profitability, which is supported by the efficiency wage theory. Moreover, Sufian (2011) investigated the impact of banks determinants on banks' profitability in Korean banking system. The study found that operating efficiency positively affect profitability of Korean banking system. Likewise, Masood and Ashraf (2012) found that operating efficiency has a positive relationship with return on equity (ROE). Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between operating efficiency and banks' profitability.

Gender diversity

Siele (2009) found that gender variation in the board produces effectiveness, productivity and value creation in an organization. The study also showed that more female directors lead to better firm performance. Similarly, Adams and Ferreira (2009) found that female directors have better attendance records than male directors and presence of female directors has positive impact on firm performance. Likewise, Mijntje (2013) revealed that women directors have positive impact on the board performance. Further, Adams and Funk (2012) revealed that female board members are more risk loving than their male counterparts. In addition, John and Olutoye (2014) revealed that the presence of female director on the board has a positive but insignificant relationship with banks' profitability. Similarly, the result showed that the proportion of female in the board of directors has a positive but insignificant relationship with profitability in Nigeria. Moreover, Noland *et al.* (2016) concluded that the presence of women in corporate leadership positions may improve firm performance. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between gender diversity and banks' 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 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 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), BS (Board size as measured by the number of board members, in numbers), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), and GD (Gender diversity as measured by the number of females in the board as a director, in numbers).

Variables	Minimum	Maximum	Mean	S.D.
ROA	0.47	3.22	1.56	0.48
ROE	3.78	69.56	15.15	6.95
CAR	7.49	22.99	13.62	2.21
BS	5.00	11.00	7.09	1.31
NIM	1.82	4.79	3.05	0.52
LDR	48.92	96.08	82.57	9.07
OE	20.35	78.37	42.50	9.90
GD	0.00	2.00	0.58	0.58

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 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), BS (Board size as measured by the number of board members, in numbers), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), and GD (Gender diversity as measured by the number of females in the board as a director, in numbers).

Variables	ROA	ROE	CAR	BS	NIM	LDR	OE	GD
ROA	1							
ROE	0.601**	1						
CAR	0.198*	0.248*	1					
BS	0.037	0.196*	-0.495**	1				
NIM	0.523**	0.258**	0.012	-0.095	1			
LDR	-0.307**	-0.370**	-0.118	-0.010	-0.294**	1		
OE	0.533**	0.215*	-0.263**	-0.046	-0.104	0.066	1	
GD	-0.210*	-0.290**	0.456**	-0.329**	-0.163	0.024	0.172	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 means that increase in capital adequacy ratio leads to increase in return on assets. Similarly, there is a positive relationship between board size and return on assets. It means that increase in board size leads to increase in return on assets. Likewise, there is a positive relationship between net interest margin and return on assets. It indicates that increase in net interest margin leads to increase in return on assets. In contrast, 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. In addition, operating efficiency has a positive relationship with return on assets. It indicates that increase in operating efficiency leads to increase in return on assets. Moreover, there is a negative relationship between gender diversity and return on assets. It means that increase in proportion of female directors on board leads to decrease in return on assets.

Similarly, the result also shows that capital adequacy ratio has a positive relationship with return on equity. It means that increase in capital adequacy ratio leads to increase in return on equity. Similarly, there is a positive relationship between board size and return on equity. It means that increase in board size leads to increase in return on equity. Likewise, there is a positive relationship between net interest margin and return on equity. It indicates that increase in net interest margin leads to increase in return on equity. In contrast, 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. In addition, operating efficiency has a positive relationship with return on equity. It indicates that increase in operating efficiency leads to increase in return on equity. Moreover, there is a negative relationship between gender diversity and return on equity. It means that increase in proportion of female directors on board 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 capital adequacy ratio (CAR), board size (BS), net interest margin (NIM), loan-to-deposit ratio (LDR), operating efficiency (OE) and gender diversity (GD) on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, board size, net interest margin, loan-to-deposit ratio, operating efficiency and gender diversity on return on assets

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 $ROA = \beta_0 + \beta_1 CAR + \beta_2 BS + \beta_3 NIM + \beta_4 LDR + \beta_5 OE + \beta_6 GD + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variable is CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), BS (Board size as measured by the number of board members, in numbers), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), and GD (Gender diversity as measured by the number of females in the board as a director, in numbers).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	BS	NIM	LDR	OE	GD			
1	0.972 (3.356)**	0.043 (2.069)*						0.013	0.478	4.281
2	1.463 (5.64)**		0.014 (0.381)					0.008	0.486	0.145
3	0.081 (0.342)			0.484 (6.315)**				0.266	0.414	39.875
4	2.1912 (7.098)**				-0.016 (3.315)**			0.085	0.463	10.992
5	2.67 (15.212)**					0.026 (6.492)**		0.278	0.411	42.143
6	1.662 (25.565)**						-0.175 (2.212)*	0.035	0.476	4.893
7	0.273 (0.511)	0.062 (2.581)**	0.063 (1.556)					0.043	0.474	3.379
8	1.508 (2.914)**	0.068 (3.371)**	0.088 (2.573)**	0.510 (0.541)				0.332	0.396	18.557
9	0.764 (1.053)	0.063 (3.112)**	0.082 (2.405)*	0.466 (6.049)**	-0.006 (1.453)			0.339	0.394	14.596
10	1.145 (1.641)	0.026 (1.389)	0.042 (1.393)	0.414 (6.199)**	-0.007 (1.815)	0.022 (6.098)**		0.512	0.339	23.256
11	1.043 (1.476)	0.037 (1.821)	0.038 (1.282)	0.421 (5.935)**	-0.007 (1.791)	0.021 (5.439)**	-0.089 (1.301)	0.515	0.337	19.034

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 asset 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 Almunani (2013). Similarly, the beta coefficients for board size are positive with return on assets. It indicates that board size has a positive impact on return on assets. This finding is inconsistent with the findings of Staikouras (2007). Likewise, the beta coefficients for net interest margin are positive with return on assets. It indicates that net interest margin has a positive impact on return on assets. This finding is similar to the findings of Marlina (2022). 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 consistent with the findings of Chowdhury and Zaman (2018). In addition, the beta coefficients for operating efficiency are positive with return on assets. It indicates that operating efficiency has a positive impact on return on assets. This finding is similar to the findings of Mehrazbin *et al.* (2023). Moreover, the beta coefficients for gender diversity are negative with return on assets. It indicates that gender diversity has a negative impact on return on

assets. This finding contradicts with the findings of Mijntje (2013).

Table 5 shows the regression results of capital adequacy ratio (CAR), board size (BS), net interest margin (NIM), loan-to-deposit ratio (LDR), operating efficiency (OE) and gender diversity (GD) on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, board size, net interest margin, loan-to-deposit ratio, and operating efficiency on return on equity

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 $ROE = \beta_0 + \beta_1 CAR + \beta_2 BS + \beta_3 NIM + \beta_4 LDR + \beta_5 OE + \beta_6 GD + e_{it}$ where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variable is CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), BS (Board size as measured by the number of board members, in numbers), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), LTD (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), OE (Operating efficiency as measured by the ratio of operating expenses to operating income, in percentage), and GD (Gender diversity as measured by the number of females in the board as a director, in numbers).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	BS	NIM	LDR	OE	GD			
1	25.818 (6.266)**	0.782 (2.621)**						0.052	6.798	6.865
2	7.768 (2.128)*		1.041 (2.055)*					0.029	6.850	8.968
3	4.684 (1.213)			3.425 (2.748)**				0.058	6.749	7.551
4	4.684 (1.213)				-3.425 (2.748)**			0.129	6.489	7.550
5	21.568 (7.420)**					0.151 (2.268)**		0.037	6.822	5.143
6	17.167 (18.805)**						-3.464 (3.122)**	0.075	6.685	9.734
7	20.182 (2.638)**	0.633 (1.841)	0.508 (0.875)					0.05	6.805	3.807
8	7.296 (0.852)	0.592 (1.782)	0.686 (1.217)	3.618 (2.965)**				0.117	6.564	5.659
9	38.061 (3.356)**	0.787 (2.491)*	0.452 (0.85)	2.205 (1.833)	-0.268 (0.325)			0.221	6.164	8.514
10	54.832 (4.495)**	1.115 (3.462)**	0.125 (0.192)	1.746 (1.497)	-0.272 (4.064)**	0.195 (3.065)**		0.280	5.925	9.250
11	53.787 (4.366)**	1.006 (2.806)**	0.068 (0.129)	1.615 (1.363)	-0.271 (4.036)**	0.176 (2.703)**	-0.841 (0.728)	0.276	5.940	7.787

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 Widyastuti *et al.* (2017). Similarly, the beta coefficients for board size are positive with return on equity. It indicates that board size has a positive impact on return on equity. This finding is consistent with the findings of Andres and Vallelado (2008). Likewise, the beta coefficients for net interest margin are positive with return on equity. It indicates that net interest margin has a positive impact on return on equity. This finding is similar to the findings of Sukmadewi (2020). Further, 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). In addition, the beta coefficients for operating efficiency are positive with return on equity. It indicates that operating efficiency has a positive impact on return on equity. This

finding is similar to the findings of Sufian (2011). Moreover, the beta coefficients for gender diversity are negative with return on equity. It indicates that gender diversity has a negative impact on return on equity. This finding contradicts with the findings of John *et al.* (2014).

4. Summary and conclusion

Banking institutions are business entities dedicated to financial intermediation, involving the allocation of surplus liquidity among different economic agents. They use deposits and other liabilities from people or firms with a surplus of resources, redirecting them to economic agents who lack such resources, in the form of loans and other assets. The banking sector is a pivotal segment in many countries so there is a need for continuous implementation of adequate policy measures and reforms in order to ensure that the banking sector performs its function efficiently. Commercial banks have a greater capacity for varying the aggregate volume of credit than other financial intermediaries. A sound, profitable, competent and well managed banks enable both the economy and the country to stay competitive and able to withstand any negative shocks.

This study attempts to analyse the effect of gender diversity, net interest margin, loan to deposit ratio and operating efficiency 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, board size, net interest margin, and operating efficiency have a positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio, board size, net interest margin, and operating efficiency, higher would be the return on assets and return on equity. However, loan-to-deposit ratio and gender diversity have a negative impact on return on assets and return on equity. It indicates that higher the loan-to-deposit ratio and gender diversity, lower would be the return on assets and return on equity. Likewise, the study also concluded that net interest margin followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese commercial banks.

References

- Adams, R. B., and D. Ferreira, 2009. Women on boardroom and their impact on governance and performance. *Journal of Financial Economics* 12(1), 291-309.
- Adams, R. B., and P. Funk, 2012. Beyond the glass ceiling: Does gender matter? *Management Science* 58(2), 219-235.
- Agustiningrum, R., 2013. Analysis of non-performing loans and loan to deposit ratio towards profitability. *International Journal of Multicultural and Multireligious Understanding* 8(1), 423-436.
- Ahmad, S., N. Bilal, and K. Z. Ahmad, 2012. Determinants of profitability of Pakistani banks: Panel data evidence for the period 2001-2010. *Journal of Business Studies Quarterly* 4(1), 149-165.
- Almumani, M. A., 2013. Impact of managerial factors on commercial banks' profitability: Empirical evidence from Jordan. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 3(3), 298-310.
- Alzoubi, T., 2018. Determinants of banks' profitability: Islamic versus conventional banks. *Banks and Bank Systems* 13(3), 106-113.
- Andres, P., and E. Vallelado, 2008. Corporate governance in banking: The role of the board of directors. *Journal of Banking and Finance* 32(12), 2570-2580.
- Ariwidanta, K. T., and I. G. B. Wiksuana, 2018. The effect of credit and liquidity risk on banks' profitability and capital adequacy ratio as mediation variables in Indonesia. *Russian Journal of Agricultural and Socio-*

Economic Sciences 81(9), 165-171.

- Bashir, A. H. M., 2003. Determinants of profitability in Islamic banks: Some evidence from the Middle East. *Islamic Economics Studies* 11(1), 31-57.
- Boateng, K., 2019. The relationship between efficiency, productivity and profitability of Ghanaian banks. *IOSR Journal of Business and Management* 21(6), 52-60.
- 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* 4(12), 43-49.
- 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.
- Chahine, S., and A. Safieddine, 2011. Is corporate governance different for the Lebanese banking system? *Journal of Management and Governance* 15(2), 207-226.
- Chaudhary, A., A. Shrestha, B. Yadav, and B. Maharjan, 2017. Effect of corporate governance on financial performance of banking and non-banking Nepalese organization. *Nepalese Journal of Business* 4(1), 133-153.
- Chishty, K. A., 2011. The impact of capital adequacy requirements on profitability of private banks in India. *International Journal of Research in Commerce and Management* 2(4), 122-129.
- Chowdhury, M. M., and S. Zaman, 2018. Effect of liquidity risk on performance of Islamic banks in Bangladesh. *Journal of Economics and Finance* 9(4), 1-9.
- Erina, J., and N. Lace, 2013. Commercial banks profitability indicators: Empirical evidence from Latvia. *IBIMA Business Review* 1(1), 27-36.
- Farkasdi, S., B. Septiawan, and E. S. Alghifari, 2021. Determinants of commercial banks profitability: Evidence from Germany. *Jurnal Riset Akuntansi Kontemporer* 13(2), 82-88.
- Gautam, R., 2018. Determinants of financial performance: Evidence from Nepalese commercial banks. *Amity Journal of Strategic Management* 1(2), 7-13.
- Golubeva, O., M. Duljic, and R. Keminen, 2019. The impact of liquidity risk on banks' 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.
- Guest, P. M., 2009. The impact of board size on firm performance: Evidence from the UK. *The European Journal of Finance* 15(4), 385-404.
- Handayani, E., and N. T. A. Fitriati, 2019. The determinants of Islamic commercial banks' profitability in Indonesia during 2012-2018. *The International Journal of Business Management and Technology* 3(5), 225-236.
- Jamal, A. A. A., M. Hamidi, and M. R. A. Karim, 2012. Determinants of commercial banks' return on asset: Panel evidence from Malaysia. *International Journal of Commerce, Business and Management* 1(3), 55-62.
- Jensen, M., 1993. The modern industrial revolution, exit, and the failure of the internal control systems. *Journal of Finance* 48(3), 831-80.
- Jha, S., and X. Hui, 2012. A comparison of financial performance of commercial banks: A case study of Nepal. *African Journal of Business Management* 6(25), 76-81.
- John, A. O., and E. A. Olutoye, 2014. Effect of board gender diversity on banks' profitability in Nigeria. *International Journal of Physical and Social Sciences* 4(10), 225-237.
- Karki, L., 2004. Liquidity ratio with loan and advances. *Journal of Nepalese Business Studies* 2(4), 32-45.
- 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), 35-52.

- Le, D. K., T. M. N. Tran, and V. D. Nguyen, 2022. Factors affecting the performance of Vietnamese commercial banks: does Basel II matter? *The Journal of Asian Finance, Economics and Business* 9(3), 43-51.
- Liyana, L., and E. Indrayani, 2020. The effect of non-performing loan (NPL), loan to deposit ratio (LDR) and net interest margin (NIM) on financial performance (ROA) with CAR as intervening variables on Go Public Commercial Banks in Indonesia and Listed on BEI Period 2014-2018. *Asian Journal of Social Science and Management Technology* 2(2), 61-75.
- Marlina, R., 2022. Determinants of banks' profitability in Indonesia based on commercial bank business activities. *The Journal of Asian Finance, Economics and Business* 9(1), 31-46.
- 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.
- 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.
- 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 banks' profitability: new evidence from Asia. *Asian Journal of Economics and Banking* 7(1), 25-44.
- Mijntje, R. L., 2013. Woman on boards and firm performance. *Journal of Management and Governance* 17(2), 491-509.
- Mittal, M., and A. Dhade, (2007). Profitability and productivity in Indian banks: A comparative study. *AIMS International*, 1(2), 137-152.
- 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.
- Nahar, F. H., C. Faza, and M. Azizurrohman, 2020. Macroeconomic analysis and financial ratios on Sharia commercial banks' profitability: A case study of Indonesia. *Journal of Islamic Economics, Finance, and Banking* 3(1), 37-50.
- Noland, M., T. Moran, and B. R. Kotschwar, 2016. Is gender diversity profitable? Evidence from a global survey. *International Journal of Economics* 16(3), 1-35.
- Ogunbiyi, S. S., 2014. Interest rates and deposit money banks profitability nexus: The Nigerian experience. *Arabian Journal of Business and Management Review* 3(11), 133-149.
- 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.
- Oral, M., and R. Yolalan, 1990. An empirical study on measuring operating efficiency and profitability of bank branches. *European Journal of Operational Research* 46(3), 282-294.
- Panta, B., 2019. Impact of credit risk management on bank performance of Nepalese commercial bank. *International Journal of Scientific and Research Publications* 9(9), 486-493.
- Pradhan, R. S., and A. K. Shrestha, 2016. The impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. *Nepalese Journal of Management* 3(3), 1-11.
- Purbaningsih, R. Y. P., and N. Fatimah, 2014. The effect of liquidity risk and non-performing financing (NPF) ratio to commercial Sharia banks' profitability in Indonesia. *International Journal of Business, Economics and Law* 16(1), 59-63.
- 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.
- 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.

- Rose, A. K., and M. M. Spiegel, 2012. Cross-country causes and consequences of the 2008 crisis: Early warning. *Japan and the World Economy* 24(1), 1-16.
- Sapa, N., and M. Awaluddin, 2022. Effect of non-performing financing and operating expenses of operating income on profitability of Islamic Commercial Banks. *International Journal of Multidisciplinary Sciences* 1(1), 455-463.
- 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.
- Shuremo, G. A., 2016. Determinants of banks' profitability: Evidence from banking industry in Ethiopia. *International Journal of Economics, Commerce and Management* 4(2), 442-463.
- Siele, J., 2009. Effects of corporate governance structure on performance of MFIs in Ghana. *Journal of Policy and Development Studies* 1(2), 24-33.
- Solihati, G. P., 2020. Analysis of factors affecting banking profitability. *International Journal of Management Studies and Social Science Research* 2(6), 36-48.
- Staikouras, P. K., C. K. Staikouras, and M. E. K. Agoraki, 2007. The effect of board size and composition on European bank performance. *European Journal of Law and Economics* 23(1), 1-27.
- Sufian, F., 2011. Profitability of the Korean banking sector: Panel evidence on bank-specific and macroeconomic determinants. *Journal of Economics and Management* 7(1), 43-72.
- 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 2012-2018. *Ilomata International Journal of Management* 1(4), 149-158.
- Suroso, S., 2022. Analysis of the effect of capital adequacy ratio (CAR) and loan to deposit ratio (LDR) on the profits of go public banks in the Indonesia stock exchange. *Scientific Journal of Accountancy, Management and Finance* 2(1), 45-53.
- Surtikanti, S., A. Saepudin, Y. Arizona, and S. D. Anggadini, 2022. The influence of capital adequacy ratio (CAR) and net interest margin (NIM) on profitability (Survey on Foreign Exchange Commercial Banks Listed in Indonesia Stock Exchange the Year 2011-2015). *Indonesian Journal of Economics, Social, and Humanities* 4(2), 111-122.
- Tariq, W., M. Usman, H. Z. Mir, I. Aman, and I. Ali, 2014. Determinants of commercial banks profitability: Empirical evidence from Pakistan. *International Journal of Accounting and Financial Reporting* 4(2), 1-22.
- 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(9), 313-324.
- Widyakto, A., Y. Suhardjo, L. P. Nss, and A. Ardiansari, 2021. Analysis of the impact of NIM, LDR and NPL on banks' profitability with variable mediating firm size (empirical study on public banks listed on IDX in 2015-2019). *Management Analysis Journal* 10(3), 257-263.
- Widyastuti, U., E. D. Purwana, and S. Zulaihati, 2017. Internal determinants of commercial banks' profitability in Indonesia. *Mediterranean Journal of Social Sciences* 8(3), 219-219.
- Yigermal, M. E., 2017. The determinants of private commercial banks profitability: In the case of selected Ethiopian private banks. *International Journal of Economic Behavior and Organization* 5(1), 25-

Chapter 10

Impact of Credit risk, Operational risk and Liquidity risk on Profitability of Nepalese Commercial Banks

Puja Sah*

Abstract

This study examines the impact of credit risk, operational risk and liquidity risk on the profitability of Nepalese commercial banks. Return on asset and return on equity are the selected dependent variables. The selected independent variables are capital adequacy ratio, credit-to-deposit ratio, non-performing loans, operational efficiency, loan loss provisions, and leverage. 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 secondary data used are annual in nature and are sourced from the Banking and Financial Statistics and Bank Supervision Report published by Nepal Rastra Bank, as well as the annual reports of selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of capital adequacy ratio, credit-to-deposit ratio, non-performing loans, operational efficiency, loan loss provisions, and leverage on the profitability of Nepalese commercial banks.

The study showed capital adequacy ratio has positive impact on return on assets. It indicates that higher the capital adequacy ratio, higher would be the return on assets. However capital adequacy ratio has negative impact on return on equity. It indicates that higher the capital adequacy ratio, lower would be the return on equity. Similarly, credit to deposit has negative impact on return on assets and return on equity. It means that higher the credit to deposit ratio, lower would be the return on asset and return on equity. Moreover, non-performing loan has a negative impact on return on asset and return on equity. It indicates that lower the non-performing loan, higher would be the return on asset and return on equity. Likewise, loan loss provision has a negative impact on return on asset and return on equity. It indicates that decrease in loan loss provision leads to increase in return on asset and return on equity. Furthermore, leverage has a negative impact on return on asset implying that higher the leverage ratio, lower would be the return on asset.

Keywords: return on asset, return on equity, capital adequacy ratio, cash to deposit ratio, non-performing loan, operational efficiency, loan loss provision, leverage

1. Introduction

The banking sector contributes significantly to the country's development. Effective, efficient, and disciplined banking institutions significantly impact the economy. The banking sector encourages capital formation, investment, trade, commerce, and industry. The strong profitability of a bank shows a higher capacity to earn profit and a bigger contribution to the economic growth of a country (Adiatmayani and Panji, 2021). The banking sector facilitates the transfer of funds between savers and borrowers. Financial performance is one of the factors that causes a bank to appear effective and efficient in carrying out its objectives (Indrayani and Anwar, 2022). Bank management must maintain adequate liquidity and profitability to meet capital needs. Banks must maintain liquidity to meet their promises to customers who withdraw money. Banking can choose to increase the distribution of funds to the public to improve financial performance, but this condition can have an impact on decreasing liquidity capacity. Bank performance greatly affects the level of public trust, so it is important for banks

* Ms. Sah is a Freelance Researcher, Kathmandu, Nepal.

to maintain good performance (Safitri *et al.*, 2020). The high level of bank capital boosts the confidence and trust of the public about the soundness of the bank. In organizations, risk is important because it forces management to pay close attention to financial developments (Carmona *et al.*, 2019). However, institutions must manage risk to avoid ambiguity about expected returns and profits. Because every bank in the world is exposed to financial risk, steps should be made to mitigate it. Banks should take the necessary precautions to avoid financial crises that result in client loss. These will allow banks to operate without accumulating debt for an extended period of time. Financial risk is divided into four subcategories: market risk, credit risk, operational risk, and liquidity risk.

Rehman *et al.* (2019) assessed the impact of risk management strategies on the credit risk faced by commercial banks of Balochistan. The study concluded that poorly managed credit risks can precipitate bank failures and economic stagnation. Moreover, Kaaya and Pastory (2019) examined the credit risk management and commercial banks' performance in Tanzania. The results showed that credit risk management indicators produced negative correlation which indicated that the higher the credit risk management the lower the bank performance. A high level of bank capital is indeed crucial in boosting public confidence and trust in the soundness of a bank. A high level of capital serves as a buffer against potential losses, ensuring that the bank can absorb financial shocks without jeopardizing its operations. This reduces the likelihood of insolvency, which enhances public confidence. Strong capital reserves assure stakeholders that the bank can meet its long-term obligations, maintaining stability even in adverse conditions. Banks with high capital levels are better positioned to meet regulatory capital requirements set by financial authorities. This compliance signals to the public that the bank adheres to strict financial standards and is less likely to face regulatory sanctions. Well-capitalized banks are perceived as better equipped to manage risks effectively, including operational, market, and credit risks. Credit risk is the probability of a financial loss resulting from a borrower's failure to repay a loan. According to Dayana and Untu (2019), credit risk is also known as default risk, is the risk arising from the failure or inability of customers to repay the loan amount obtained from the company, as well as interest, within a predetermined period using non-performing loans. Credit risk is a significant danger that can undoubtedly devastate the banking industry (Naili and Lahrichi, 2022). Ekinici and Poyraz (2019) assessed the effect of credit risk on financial performance of deposit banks in Turkey. The study found that credit risk is the exposure faced by banks when a borrower (customer) defaults in honoring debt obligations on the due date or at maturity.

A stable banking sector contributes to overall economic stability. When banks are well-capitalized, they are better able to support economic activities by providing loans and other financial services, fostering public confidence in the broader economy. High capital levels across banks reduce the risk of systemic failures, where the collapse of one bank could lead to a domino effect in the financial system. This systemic stability reassures the public about the safety of their deposits and investments. High levels of bank capital are essential for maintaining public confidence and trust in the banking sector. They provide a robust financial cushion, ensure regulatory compliance, enhance risk management capabilities, and contribute to overall economic stability. These factors collectively reassure customers, investors, and regulators about the soundness and reliability of the bank. Operational risk is considered as one of the serious concerns and challenges for modern banks. Operational risk occurs due to incompetence and abuse of power, failure of information processing, transmission, data retrieval, and inaccurate output (Mwanja, 2021). Operating efficiency is measured by the ratio between total operating costs and total operating income of a bank (Endri, 2018). Muthia *et al.* (2019) indicated that when risk from operational efficiency is managed appropriately, this could lead to higher profitability. Gadzo *et al.* (2019) observed that credit risk and operational risk on the financial performance of universal banks in Ghana. The study revealed that operational risks play a major role because they stem

from credit management which accounts for almost three-quarters of the total bank's assets. Similarly, Erina and Lace (2013) assessed the impact of the external and internal factors of bank performance on the profitability indicators of Latvian commercial banks. The study found that profitability has a positive association with operational efficiency measured by ROA and ROE. Liquidity risk measures the liquid and solvency of the bank. Eljelly (2019) argued that adequate level of liquidity is positively related to profitability. Managers usually face the tough balancing act of ensuring that funds are available to cater for withdrawals. Liquidity is always a concern of banks in maintaining profitability. Managing liquidity requires a flexible adaptation to circumstances and conditions. The appropriate level of liquidity will contribute to increasing the bank's profitability. Banks have advanced risk management systems in place which enables the banks to pay off their liabilities when they become due, thus reducing the chances of cash blockage and eventually liquidity crunch (Kumar and Yadav, 2013). Abdelaziz *et al.* (2022) explored the interactional relationships between credit risk, liquidity risk and bank profitability in MENA region. The study revealed that profitability of MENA banks is negatively and significantly sensitive to an increase in credit and/or liquidity risks.

Banks are therefore encouraged to implement efficient risk management practices to safeguard investor interests and ensure sustainability (Harb *et al.*, 2023). Rohamana and Kristijadi (2024) examined determining factors of commercial bank profitability in Indonesia using the panel data regression. The study stated that LDR ratio has an insignificant positive effect on ROA. Similarly, Nugraha *et al.* (2021) investigated the impact of non-performing loans, loan to deposit ratio and education diversity on the firm performance of Indonesia banking sectors. The study found a significant negative relationship between non-performing loans (NPL) and the profitability (ROA). Furthermore, Oba *et al.* (2023) examined risk management and financial performance of listed commercial banks in Nigeria. The study indicated that loan loss provisions exhibited a significant relationship with return on equity of listed commercial banks in Nigeria. Likewise, Murtiningrum and Wahyuningsih (2024) observed the effect of financial ratios on ROA at commercial banks on the IDX. The study found that BOPO significantly influence the ROA. The study also found that BOPO has partially positive and significant influence on ROA. Similarly, Sofyan (2019) analyzed financial performance of rural banks in Indonesia. The results of the study showed that CAR has a significant effect on ROA.

In the context of Nepal, the efficient and effective performance of the banking industry over time guarantees the financial stability of any nation (Gnawali, 2018). Shah and Vongbusin (2019) investigated the relationship between credit risk management and profitability in Nepalese commercial banks. The study found that loan loss provision, non-performing loan, capital adequacy ratio and leverage have negative relationship with return on assets. Poudel (2018) assessed credit risk in Nepali commercial banks. The study revealed that liquidity has the significant positive impact on credit risk in Nepalese commercial banks. 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 impact of credit risk, operational risk and liquidity risk on the 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 major objective of the study is to examine impact of credit risk, operational risk and liquidity risk on profitability of Nepalese commercial banks. Specifically, it examines the relationship are capital adequacy ratio, credit-to-deposit ratio, non-performing loans, operational efficiency, loan loss provisions, and leverage on return on assets and return on equity 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 2015/16 to 2022/23, leading to a total of 104 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	Siddharth Bank Limited	2015/16 - 2022/23	8
2	Citizens Bank International Limited	2015/16 - 2022/23	8
3	Standard Chartered Bank Nepal Limited	2015/16 - 2022/23	8
4	Himalayan Bank Limited	2015/16 - 2022/23	8
5	Rastriya Banijya Bank Limited	2015/16 - 2022/23	8
6	Prime Commercial Bank Limited	2015/16 - 2022/23	8
7	Everest Bank Limited	2015/16 - 2022/23	8
8	NMB Bank Limited	2015/16 - 2022/23	8
9	Nepal SBI Bank Limited	2015/16 - 2022/23	8
10	Agricultural Development Bank Limited	2015/16 - 2022/23	8
11	Machhapuchchhre Bank Limited	2015/16 - 2022/23	8
12	Sanima Bank Limited	2015/16 - 2022/23	8
13	Prabhu Bank Limited	2015/16 - 2022/23	8
Total number of observations			104

Thus, the study is based on the 104 observations.

The model

The model used in this study assumes that bank profitability depends on credit risk, operational risk and liquidity risk. The dependent variables selected for the study are return on asset and return on equity. Similarly, the selected independent variables in this study are capital adequacy ratio, credit-to-deposit ratio, non-performing loans, operational efficiency, loan loss provisions, and leverage. Therefore, the models take the following forms:

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

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

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 shareholders' equity, in percentage.

CD = Credit to deposit ratio as measured by the ratio of total loan to total deposit, 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 movement in loan loss provision, Rs. in million.

OE = Operating efficiency is measured by the ratio of operating expenses to operating income, in times.

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

LEV = Leverage as measured by the ratio of total liabilities to total assets, in times.

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

Credit to deposit ratio

The credit-to-deposit ratio measures a bank's liquidity by comparing its total loans to total deposits during the same time period. Juniarti (2021) found that the loan to deposit ratio (LDR) variable is positive and insignificant effect on profitability which is calculated using return on assets (ROA). Similarly, Moreover, Rajindra *et al.* (2021) found that loan to deposit ratio has a positive and insignificant effect on return on asset. Likewise, Rusmini and Adiandari (2020) indicated that there is positive and insignificant effect of loan to deposit ratio on profitability. Moreover, Gazi *et al.* (2021) concluded that LDR have positive significant effect on ROA. Hadian and Phety (2021) revealed that there is a positive impact of loan to deposit ratio on return on assets. Furthermore, Hasna *et al.* (2020) stated that the higher the LDR of a bank entity, the better the bank's performance in terms of profitability with higher risk. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between credit to deposit ratio and bank profitability.

Loan loss provision

Banks must account for loan loss provisions, which are non-cash expenses resulting from potential future losses due to loan failure. Banks create this contingency assuming that some loans may not be paid on time. Pelealu and Worang (2017) revealed that loan loss provision has insignificant negative impact on return on assets. Similarly, Alshebmi *et al.* (2020) revealed that loan loss provision has statistically significant negative impact on return on assets. Similarly, Mennawi (2020) found that there is a significant negative impact on the financial performance of Islamic banks. In addition, Saleh and Winarso (2021) found that there was negative impact of NPL and loan loss provision on ROA.

Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between loan loss provision and bank profitability.

Non-performing loan

A nonperforming loan (NPL) is one on which the borrower has defaulted and has not made any scheduled principle or interest payments for a specified period of time. Non-performing loans is measured as the percentage of non-performing loans to total loans. Besmir and Aliu (2021) found a significant negative relationship between non-performing loan and profitability as measured by return on assets. Similarly, nonperforming loans in banking will have a negative impact on profitability (Ichsan *et al.*, 2021). Siddique *et al.* (2022) showed empirical evidence that NPL negatively affects the financial performance of banking sector. Moreover, Uddin (2022) showed that non-performing loan (NPL) has also a negative and insignificant effect on ROA. Similarly, Mandagie (2021) stated that NPL has a significant negative impact on ROA in the banking business. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between non-performing loan and bank profitability.

Operational efficiency

Oktasari *et al.* (2024) showed that the operating expenses operating income (BOPO) has a negative and significant effect on profitability (ROA). Further, Utama *et al.* (2024) concluded that the bank efficiency (BOPO) has negative and significant effect on ROA. Moreover, operational revenue to operating expense (BOPO) has a negative effect on return on assets (Suardana *et al.*, 2018). According to Sarra *et al.* (2022), operational expenses against revenue operations (BOPO) have a negative effect on profitability (ROA). profitability. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between operational efficiency and bank profitability.

Capital adequacy ratio

The capital adequacy ratio (CAR), also known as the capital-to-risk-weighted assets ratio, assesses a bank's financial strength based on capital and assets. It is used to protect depositors while also promoting global financial system stability and efficiency. Muawanah and Imronudin (2021) indicated that CAR has a positive and significant effect on profitability. Latuamury *et al.* (2022) showed that the capital adequacy ratio has a positive effect on profitability. Likewise, Sunaryo (2020) found that capital adequacy ratio (CAR) has a positive and significant effect on return on asset (ROA). Furthermore, capital adequacy ratio has a (significant) positive effect on profitability (ROA) (Amalia and Nugraha, 2021). Moreover, CAR has a positive and significant effect on ROA (Fajriati *et al.*, 2021). Barus *et al.* (2017) stated that capital adequacy is positively related to return on assets (ROA) and return on equity (ROE). Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between capital adequacy ratio and bank profitability.

Leverage

The company's leverage is measured by comparing its total debt to total assets. Bunyaminu *et al.* (2021) showed that leverage negatively and significantly affects banks' profitability. Moreover, Mennawi (2020) revealed that the credit risk and financial leverage have significant negative impact

on the financial performance of Islamic banks in Sudan. Furthermore, Bintara (2020) concluded that leverage has a negative effect on profitability. Moreover, Yakubu *et al.* (2017) concluded that there is a negative relationship between profitability and leverage. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship negative leverage and bank 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 13 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 shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage) CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), NPL (Non-performing loan 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), LLP (Loan loss provision as measured as movement in the loan loss provision, Rs in million) and OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage).

Variables	Minimum	Maximum	Mean	S. D.
ROA	0.47	3.23	1.57	0.51
ROE	3.78	24.53	14.34	4.56
CAR	8.55	22.99	13.88	2.5
CD	55.18	92.75	76.49	7.37
NPL	0.01	8.38	1.47	1.4
LEV	0.81	0.94	0.89	0.03
LLP	11.32	10232.46	2657.22	2145.81
OE	0.13	0.62	0.41	0.09

Correlation analysis

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

Table 3

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 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 shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage) CD (Credit to deposit ratio as measured by the ratio of total loan

to total deposit, in percentage), NPL (Non-performing loan 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), LLP (Loan loss provision as measured as movement in the loan loss provision, Rs in million) and OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage).

Variables	ROA	ROE	CAR	CD	NPL	LEV	LLP	OE
ROA	1							
ROE	0.525**	1						
CAR	0.403**	-0.102	1					
CD	-0.224*	-0.258**	-0.188	1				
NPL	-0.040	-0.121	-0.075	-0.074	1			
LEV	-0.466**	0.194*	-0.739**	0.059	-0.032	1		
LLP	-0.303**	-0.454**	-0.214*	0.158	0.632**	0.189	1	
OE	-0.429**	-0.330**	-0.173	-0.075	0.266**	0.133	0.292**	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 means that increase in capital adequacy ratio leads to increase in return on assets. In contrast, there is a negative relationship between credit to deposit and return on asset. It means that increase in credit to deposit leads to decrease in return on assets. Similarly, there is a negative relationship between non-performing loan and return on assets. It means that increase in non-performing loan leads to decrease in return on assets. Likewise, leverage has a negative relationship with return on assets. It shows that higher the leverage, lower would be the return on assets. Likewise, 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. In addition, operational efficiency has a negative relationship with return on assets. It indicates that increase in operational efficiency leads to decrease in return on assets.

Likewise, the result also shows that 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 credit to deposit and return on equity. It means that increase in credit to deposit leads to decrease in return on equity. Similarly, there is a negative relationship between non-performing loan and return on equity. It means that increase in non-performing loan leads to decrease in return on equity. Likewise, leverage has a positive relationship with return on equity. It shows that higher the leverage, higher would be the return on equity. Likewise, there is a negative relationship between loan loss provision and return on equity. It indicates that increase in loan loss provision leads to decrease in return on equity. In addition, operational efficiency has a negative relationship with return on equity. It indicates that increase in operational efficiency leads to decrease in return on equity.

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 capital adequacy ratio, credit-to-deposit ratio, non-performing loans, operational efficiency, loan loss provisions, and leverage with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, credit to deposit, non-performing loan, leverage, loan loss provision and operational efficiency on return on assets of Nepalese commercial banks

The result is based on panel data of 13 commercial banks with 104 observations for the study period from 2015/16 to 2022/23 by using linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 CD_{it} + \beta_2 NPL_{it} + \beta_3 LLP_{it} + \beta_4 OE_{it} + \beta_5 CAR_{it} + \beta_6 LEV_{it} + e_{it}$ where the dependent variable is ROA (Return on assets is 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 bank capital to total risk weighted assets, in percentage) CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), NPL (Non-performing loan 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), LLP (Loan loss provision as measured as movement in the loan loss provision, Rs in million) and OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		CAR	CD	NPL	LEV	LLP	OE			
1	0.434 (1.672) 2.746 (5.386)**	0.082 (4.450)**						0.154	0.466	19.806
2	1.591 (21.974)**		-0.015 (2.319)*					0.041	0.496	5.379
3	9.946 (6.311)**			-0.015 (0.406)				0.008	0.508	0.165
4	1.759 (23.167)**				-9.435 (5.317)**			0.209	0.450	28.271
5	2.597 (11.875)**					-7.139 (3.205)**		0.083	0.485	10.274
6	1.322 (2.246)*	0.076 (4.095)**	-0.011 (1.678)					0.176	0.459	23.064
7	1.352 (2.245)*	0.076 (4.035)**	-0.011 (1.687)	-0.009 (0.264)				0.161	0.464	7.611
8	9.951 (3.612)**	0.011 (0.411)	-0.013 (2.176)*	-0.23 (0.725)	-8.428 (3.192)**			0.232	0.444	8.780
9	8.586 (3.112)**	0.013 (0.506)	-0.010 (1.538)	0.42 (1.001)	-7.167 (2.714)**	-6.435 (2.322)*		0.265	0.434	8.414
10	9.849 (3.900)**	0.002 (0.092)	-0.130 (2.262)*	0.057 (1.504)	-7.184 (2.991)**	-4.548 (1.781)	-2.210 (4.626)**	0.391	0.395	12.039

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 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 Muawanah and Imronudin (2021). Similarly, the beta coefficients for credit to deposit has negative impact on return on assets. This finding is consistent with the findings of Rusmini and Adiandari (2020). Likewise, the beta coefficients for nonperforming loan are negative with return on assets. It indicates that nonperforming has a negative impact on return on assets. This finding is similar to the findings of Besmir and Aliu (2021). Furthermore, the beta coefficients for leverage are negative with return on assets. It indicates that leverage has a negative impact on return on assets. This finding is consistent with the findings of Mennawi (2020). Moreover, 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 Saleh and Winarso (2021). Likewise, 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 consistent with the findings of Oktasari *et al.* (2024).

Table 5 shows the estimated regression results of capital adequacy ratio, credit to deposit, non-performing loan, leverage, loan loss provision and operational efficiency on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, credit to deposit, non-performing loan, leverage, loan loss provision and operational efficiency on return on equity of Nepalese commercial banks

The result is based on panel data of 13 commercial banks with 104 observations for the study period from 2015/16 to 2022/23 by using linear regression model. The model $ROE_{it} = \beta_0 + \beta_1 CD_{it} + \beta_2 NPL_{it} + \beta_3 LLP_{it} + \beta_4 OE_{it} + \beta_5 CAR_{it} + \beta_6 LEV_{it} + e_{it}$ where the dependent variable is ROE (Return on equity is 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 bank capital to total risk weighted assets, in percentage) CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage), NPL (Non-performing loan 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), LLP (Loan loss provision as measured as movement in the loan loss provision, Rs in million) and OE (Operating efficiency is measured by the ratio of operating expenses to operating income, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	CD	NPL	LEV	LLP	OE			
1	16.933 (6.670)**	-0.187 (1.038)						0.001	4.560	1.078
2	26.556 (5.833)**		-0.160 (2.696)**					0.057	4.429	7.267
3	14.916 (23.027)**			-0.394 (1.230)				0.005	4.550	1.512
4	-17.095 (1.086)				35.406 (1.998)*			0.028	4.497	3.992
5	16.905 (26.446)**					-0.001 (5.150)**		0.199	4.083	26.526
6	21.452 (10.418)**						-17.267 (3.530)**	0.100	4.327	12.463
7	31.910 (5.697)**	-0.286 (1.617)	-0.178 (2.972)**					0.072	4.394	4.998
8	33.693 (5.954)**	-0.312 (1.772)	-0.187 (3.133)**	-0.508 (1.645)				0.087	4.357	4.291
9	-0.599 (0.022)	-0.55 (0.207)	-0.176 (2.941)**	-0.451 (1.450)	33.611 (1.301)			0.094	4.342	3.663
10	-32.201 (1.380)	-0.002 (0.007)	-0.089 (1.690)	-1.050 (2.972)**	62.820 (2.813)**	-0.001 (6.357)**		0.352	3.673	12.178
11	-23.034 (1.049)	-0.083 (0.394)	-0.113 (2.280)**	-1.163 (3.504)**	62.693 (3.000)**	-0.001 (6.089)**	-16.043 (3.861)**	0.432	3.437	14.073

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 negative with return on equity. It indicates that capital adequacy ratio has a negative impact on return on equity. This finding contradicts with the findings of Latuamury *et al.* (2022). Similarly, the beta coefficients for credit to deposit ratio has negative impact on return on equity. It indicates that credit to deposit ratio has a negative impact on return on equity. This finding is in contrast with the findings of Hasna *et al.* (2020). Similarly, the beta coefficients for nonperforming loan are negative with return on equity. It indicates that nonperforming has a negative impact on return on equity. This finding is similar to the findings of Mandagie (2021). Furthermore, the beta coefficients for leverage are positive with return on equity. It indicates that leverage has a positive impact on return on assets. This finding is similar to the findings of Bintara (2020). Moreover, 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 with the findings of Alshebmi *et al.* (2020). Likewise, 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 contradicts with the findings of Sarra *et al.* (2022).

4. Summary and conclusion

Poor bank performance led to failure and financial crises that have negative consequences for economic development. A healthy and sustainable profitability is important in maintaining the stability of the banking system for sustainable growth in general. 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 impact of credit risk, operational risk and liquidity risk on profitability of Nepalese commercial banks. 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 study showed that capital adequacy ratio has positive impact on return on assets. However, credit to deposit, nonperforming loan, leverage, loan loss provision and operational efficiency have negative impact on return on assets. Furthermore, the study showed that shows leverage has positive impact on return on equity. However, capital adequacy ratio, credit to deposit, nonperforming loan, loan loss provision and operational efficiency have negative impact on return on equity. The study concluded that leverage followed by operational efficiency is the most influencing factor that determine the return on assets of Nepalese commercial banks. The study also concluded that loan loss provision is the most influencing factor that determine the return on equity of Nepalese commercial banks.

References

- Abdelaziz, H., B. Rim, and H. Helmi, 2022. The interactional relationships between credit risk, liquidity risk and bank profitability in MENA region. *Global Business Review* 23(3), 561-583.
- 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.
- Alshebmi, A. S., M. H. M. Adam, A. M. A. Mustafa, M. Thomran, and O. E. A. Fathelbab, 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), 69-90.
- Amalia, S., and N. M. Nugraha, 2021. The impact of financial ratio indicators on banking profitability in Indonesia. *Turkish Journal of Computer and Mathematics Education* 12(8), 580-588
- Barus, J. J., W. Muturi, P. Kibati, and J. Koima, 2017. Effect of capital adequacy on the financial performance of savings and credit societies in Kenya. *American Journal of Finance* 1(4), 1-12.
- Besmir, C., and M. Aliu, 2021. Impact of non-performing loans on bank's profitability: Empirical evidence from commercial banks in Kosovo. *Journal of Accounting, Finance and Auditing Studies* 7(3), 226-242.
- Bintara, R., 2020. The effect of working capital, liquidity and leverage on profitability. *Saudi Journal of Economics and Finance* 4(1), 28-35.
- Bunyaminu, A., I. N. Yakubu, and S. Bashiru, 2021. The effect of financial leverage on profitability: an empirical analysis of recapitalized banks in Ghana. *International Journal of Accounting and Finance Review* 7(1), 93-102.

- 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.
- Chhetri, S. B., 2023. Credit risk, liquidity risk and profitability in Nepalese commercial banks. *International Journal of Finance and Commerce* 5(1), 24-31.
- Dayana, P., and V. N. Untu, 2019. Analysis of market risk, credit risk, operational risk and capital adequacy to the financial performance of bank pembangunan daerah se-Indonesia periode 2012-2017. *Jurnal EMBA* 7(3), 3798 -3807.
- 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.
- Eljelly, M. M., 2019. Liquidity and profitability performance analysis of selected telecoms companies. *International Journal of Research in Regional Studies, Law, Social Sciences, Journalism and Management Practices* 1(8), 365-376.
- Endri, E., 2018. Impact of intellectual capital and efficiency to the profitability of Islamic banking. *International Journal of Science and Research* 7(7), 230-237.
- Erina, J., and N. Lace 2013. Commercial banks profitability indicators: Empirical evidence from Latvia. *IBIMA Business Review* 13(2), 27-36.
- Fajriati, L. A., A. A. Rahman, and S. Maharani, 2021. Effect of financing to deposit ratio and non-performing financing of return on assets with a capital adequacy ratio as variable intervening in Islamic banking in Indonesia in 2012-2019. *Niqosiya: Journal of Economics and Business Research* 1(2), 286-302.
- Gadzo, S. G., H. K. Kportorgbi, and J. G. Gatsi, 2019. Credit risk and operational risk on the financial performance of universal banks in Ghana: A partial least squared structural equation model (PLS-SEM) approach. *Cogent Economics and Finance* 7(1), 1-16.
- Gazi, M. A. I., M. S. Alam, G. M. A. Hossain, S. N. Islam, M. K. Rahman, M. Nahiduzzaman, and A. I. Hossain, 2021. Determinants of profitability in banking sector: Empirical evidence from Bangladesh. *Universal Journal of Accounting and Finance* 9(6), 1377-1386.
- 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.
- 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 (TURCOMAT)* 12(8), 791-798.
- Harb, E., R. El Khoury, N. Mansour, and R. Daou, 2023. Risk management and bank performance: evidence from the MENA region. *Journal of Financial Reporting and Accounting* 21(5), 974-998.
- Hasna, D. P., D. S. Ariyani, L. F. Ula, R. S., Putri, and Y. H. Prayitno, 2020. The effect of third-party funds and liquidity (LDR) on banking profitability (ROA) (case study of BUMN banks listed on the Indonesia Stock Exchange from 2012 to 2019). *PalArch's Journal of Archaeology of Egypt/Egyptology* 17(4), 2914-2927.
- Ichsan, R. N., S. Suparmin, M. Yusuf, R. Ismal, and S. Sitompul, 2021. Determinant of Sharia bank's financial performance during the covid-19 pandemic. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences* 4(1), 298-309.
- Indrayani, T., and S. Anwar, 2022. Analisis pengaruh intellectual capital, profit sharing ratio, zakat performance ratio, Islamic income ratio dan income diversification terhadap return on asset. *Jurnal Revenue: Jurnal Ilmiah Akuntansi* 2(2), 271-281.

- Juniarti, W., 2021. The effect of capital adequacy ratio (CAR) and loan to deposit ratio (LDR) to return on asset (ROA) on PT BJB Tbk. *Indonesian Financial Review* 1(2), 133-146.
- Kaaya, I., and D. Pastory, 2019. Credit risk management and commercial banks performance in Tanzania: A panel data analysis. *Research Journal of Finance and Accounting* 4(16), 55- 62.
- Kumar, M., and G. C. Yadav, 2013. Liquidity risk management in bank: a conceptual framework. *AIMA Journal of Management and Research* 7(2), 2-12.
- Latuamury, J., P. A. Cakranegara, R. S. Butar-butur, and S. P. D. Anantadjaya, 2023. Profitability factors using the loans to deposits ratio as a moderating variable. *SEIKO: Journal of Management and Business* 6(1), 875-886.
- Mandagic, Y. R. O., 2021. Analyzing the Impact of CAR, NIM and NPL on ROA of banking companies (an empirical study on BEI listed companies). *INQUISITIVE* 1(2), 72–87.
- 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.
- Muawanah, E., and I. Imronudin, 2021. Analysis of the effect of capital adequacy ratio, non-performing financing, and financing to deposit ratio on profitability: A case study on Islamic commercial banks in Indonesia. *Journal of Management and Islamic Finance* 1(1), 32-47.
- Murtiningrum, W., and E. Wahyuningsih, 2024. Analysis of the effect of financial ratios on ROA at commercial banks on the IDX. *ASEAN International Journal of Business* 3(1), 12-19.
- Muthia, F., R. Ghasarma, and S. Andaiyani, 2019. The nexus between operational risk and profitability in Islamic banking. *Advances in Economics, Business and Management Research Journal* 142(5), 407-411.
- Mwanja, S. K., 2021. Effect of operational and market risk exposures on financial performance of DT-saccos in Kenya. *International Journal of Research in Business and Social Science* 10(5), 107–118.
- Naili, M., and Y. Lahrichi, 2022. The determinants of banks' credit risk: Review of the literature and future research agenda. *International Journal of Finance and Economics* 27(1), 334-360.
- 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* 11(3), 9-15.
- Oba, O. C., B. E. Onodi, and E. E. Ezinando, 2023. Risk management and financial performance of listed commercial banks in Nigeria. *Journal of Business and Economic Policy* 1(3), 27-47.
- Oktasari, D. P., W. Widyanty, and R. Lestari, 2024. Profitability determinants in Indonesian conventional banking companies. *International Journal of Management Studies and Social Science Research* 6(2), 84-94.
- Pelealu, I. W., and F. G. Worang, 2017. Analysis the effect of loan loss provision on bank profitability. *Jurnal EMBA: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi* 6(4), 3278-3287.
- Poudel, S. R., 2018. Assessment of credit risk in Nepali commercial banks. *Journal of Applied and Advanced Research* 3(3), 65-72.
- 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.
- Rehman, Z. U., N. Muhammad, B. Sarwar, and M. A. Raz, 2019. Impact of risk management strategies on the credit risk faced by commercial banks of Balochistan. *Financial Innovation* 5(44), 1-13.

- Rohamana, F. D., and E. Kristijadi, 2024. Determining factors of commercial bank profitability in Indonesia: Panel data regression. *IRJEMS International Research Journal of Economics and Management Studies* 3(2), 9-16.
- Rusmini, N. M., and A. M. Adiandari, 2020. Effect of loan to deposit ratio (LDR) and BOPO on profitability on PT BPR BALI ambassador for the year 2014-2018. *Neraca: Jurnal Akuntansi Terapan* 1(2), 84-93.
- Safitri, K. Y. D., I. M. Mertha, N. G. P. Wirawati, and A. A. Dewi, 2020. The impact 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 (AJHSSR)* 4(5), 49-56.
- 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.
- Sarra, H. D., M. Mikrad, and S. Sunanto (2022). Analisis pengaruh tingkat kesehatan bank menggunakan metode rgec terhadap profitabilitas pada perusahaan perbankan periode 2015-2019. *Dynamic Management Journal* 6(2), 110-121.
- Shah, M., and V. Vongbusin, 2019. Credit risk management and profitability: A study from Nepalese commercial bank. *Nepalese Journal of Management Science and Research* 2(1), 42-47.
- 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.
- Sofyan, M., 2019. Analysis financial performance of rural banks in Indonesia. *International Journal of Economics, Business and Accounting Research (IJEBAAR)* 3(3), 255-262.
- Suardana, I. B. R., I. N. D. Astawa, and L. K. B. Martini, 2018. Influential factors towards return on assets and profit change (study on all BPR in Bali province). *International Journal of Social Sciences and Humanities* 2(1), 105-116.
- 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. *Ilomata International Journal of Management* 1(4), 149-158.
- 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.
- Utama, J. N., T. Nirmala, T. Andrian, N. Herlina, and U. Ciptawaty, 2024. Analysis of the effect of green banking and financial performance on the profitability of member banks of the Indonesian sustainable finance initiative. *Sinomics Journal* 2(6), 1771-1776.
- Yakubu, I. N., M. M., Alhassan, A. A. Mikhail, and A. N. I. Alhassan, 2017. Commercial banks performance in Ghana: Does capital structure matter? *International Journal of Accounting and Financial Reporting* 7(1), 333-342.

Chapter 11

A CAMEL Model Analysis of Nepalese Public, Private and Joint Venture Commercial Banks

Saroj Magar*

Abstract

This study examines the effect of CAMEL model analysis on the profitability of Nepalese commercial banks. The dependent variables selected for the study are return on assets and return on equity. The selected independent variables are capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio 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 Banking and Financial Statistics published by Nepal Rastra Bank, publications and websites of 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 CAMEL model analysis on the profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact on return on assets. It indicates that the increase in capital adequacy ratio leads to increase in return on assets. In addition, management efficiency has a negative impact on return on assets and return on equity. It means that increase in operating expense ratio leads to decrease in return on assets and return on equity. Furthermore, earning quality has a positive impact on return on assets and return on equity. It indicates that increase in earning quality leads to increase in return on assets and return on equity. Similarly, liquidity ratio has a negative impact on return on equity. It indicates that increase in liquidity ratio leads to increase in return on equity. In addition, loan to deposit ratio has a negative impact on return on assets and return on equity. It means that increase in loan to deposit ratio leads to decrease in return on assets and return on equity. Similarly, assets quality has a negative impact on return on equity. It means that higher the nonperforming loans, lower would be the return on equity.

Keywords: capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio, loan to deposit ratio, return on assets, return on equity

1. Introduction

The banking sector is the backbone of any economy and this gains more importance for a country. As the banking sector has a major impact on the economy as a whole, evaluation, analysis, and monitoring of its performance is very important. As a recognized internationally standardized rating tool, CAMEL is considered a modern tool and the most appropriate approach for managerial and financial assessment of banks (Nguyen et al., 2020). It is also considered a very useful mechanism that provides flexibility between on-site and off-site examination thus serving as the main model for evaluating bank performance. In order to maintain the financial soundness and efficiency, authorities impose regulations on banks to ensure safeness and soundness of the banking system. CAMEL model is universally applied framework for measuring efficiency of financial system (Islam and Shohidul, 2018). The impact of capital adequacy ratio, assets quality, management efficiency, earning quality and liquidity have the great importance in determining the overall efficiency of the commercial banks. Kumar et al. (2013) argued that financial health of a bank is a guarantee not only for depositors, but also

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

of great significance to employees, shareholders and the whole economy of a nation. To evaluate the performance of the banking industry, it is necessary to use efficiency indicators to check the soundness of the activities of an economy. Banks, in particular, face a range of risks that are becoming more and more complex every day. It is important to assess the overall effectiveness of banks using the prescribed banking supervision framework, and the CAMEL rating system is an effective monitoring measure.

Rauf (2016) evaluated comparative ability of financial performance of banks in Sri Lanka using CAMEL model. All the CAMEL model parameters (capital adequacy, assets quality, management quality, earning quality, liquidity) were used as independent variables and as the indicators of financial performance return on equity (ROE) and return on assets (ROA) were considered as dependent variable. The study found that private banks are best in all parameters of CAMEL and financial performance. However, performances of public banks were less compared to the private banks. The study also revealed that capital adequacy, assets quality and earning quality were significantly correlated to financial performance, and management efficiency and liquidity were not significantly correlated to financial performance of the banks. Zagherd and Barghi (2017) examined the performance evaluation of Iranian banking industry through CAMELS framework. The results showed that the impact of capital adequacy, asset quality, management quality, liquidity quality, and sensitivity to market risk indicators is direct and significant on the return on assets of banks in the Iranian banking industry, but the effect of earnings quality is rejected on the return on assets of banks in the Iranian banking industry. Sarakiri (2023) investigated the impact of risk management on bank profitability using panel data obtained from eleven (11) banks in Nigeria for the period from 2010 to 2019. The study found that capital adequacy ratio exerts a positive effect on both return on net interest margin and return on assets. Similarly, loan to deposit ratio exerts a positive effect on both net interest margin and return on assets. Moreover, non-performing loan ratio has a highly significant and negative impact on bank profitability. Overall, the empirical analysis showed that risk management enhances the profitability of Nigerian banks but at the expense of their competitive efficiency.

Ping and Kusairi (2020) investigated the impact of CAMEL on bank performance in developed countries using static panel method analysis. CAMEL ratio is a bank-specific factor that is always used in measuring bank performance. The study showed that capital adequacy and earning quality had a positive impact on bank performance and conversely asset quality, management efficiency, and liquidity have a negative effect on bank performance. Likewise, Trung (2021) assessed the determinants of Vietnamese commercial banks' performance from 2009 to 2020. The study dealt with the CAMELS model as a framework for evaluating and measuring banks' performance. The study revealed that the variables that positively affect banks' performance were capital adequacy ratio, management, earnings, liquidity and macro-variables. Conversely, asset quality and sensitivity have the reverse relationship with banks' performance. Bhatti *et al.* (2022) examined the impact of risk management techniques on the financial performance of banks listed in the stock market. The CAMEL model which is one of the widely used models to assess the relationship between the bank risk and bank performance has been used. The study showed that CAMEL framework significantly affects the EVA model in assessing financial performance. Similarly, Singh and Milan (2023) analyzed financial performance of public sector banks in India using CAMEL framework. The study found that the asset quality is negatively related to performance of public sector banks. Liquidity and inflation are inversely related to performance of public sector banks in India. Moreover, capital adequacy is positively related to banks' performance and earnings has a significant positive impact on banks' performance.

Tibebe and Gujral (2022) investigated the determinants of commercial banks profitability in Ethiopia using panel data of thirteen commercial banks from year 2010 to 2018. The study revealed that

management efficiency, bank size and capital adequacy are the major significant determinants of bank profitability in Ethiopia. The study also found that capital adequacy ratio has positively and statistically significant effect on profitability of commercial banks in Ethiopia. Setiawan and Nupus (2021) analyzed the effect of capital adequacy ratio and loan to deposit ratio on banking profitability. The study found that capital adequacy ratio has a positive and significant effect on the profitability of domestic banks and capital adequacy ratio has a positive and insignificant effect on the profitability of foreign banks. The result found that capital adequacy ratio and loan to deposit ratio have a positive and significant influence on the profitability in state owned banks. Ben Lahouel et al. (2024) examined whether and how liquidity risk impacts European banks' stability (i.e., a bank risk-return profile) under different levels of engagement in non-traditional banking activities after the global financial crisis and during the implementation of the Basel III liquidity rules. The study showed that liquidity risk stemming from liquidity creation has a positive impact on bank stability, implying that income diversification can serve as a "buffer" through which banks can ensure their liquidity creation and offset for the compression of intermediation margin in lending and deposit activities. This suggests that diversification does not impede the ability of banks to operate with lower liquidity holdings but allows them to make greater use of their balance sheets to fulfill their primary roles of credit provision and liquidity creation.

In the context of Nepal, Kafle (2023) examined the impact of credit risk management on profitability of Nepalese commercial banks. The result revealed that capital adequacy ratio, loan to deposit ratio, cash reserve ratio, and bank size has been found to have a positive effect on banks' profitability, and non-performing loan ratio negatively affects banks' profitability. Thus, the study further concluded that credit risk management is an essential predictor of the profitability of Nepalese commercial banks. Khanal and Sapkota (2023) investigated the effect of credit risk management on financial performance of commercial banks in Nepal. The study found that capital adequacy ratio, non-performing loans ratio, and bank size have positive and insignificant effect on return on asset and negative and insignificant effect of credit to deposit ratio on return on asset. Similarly, there is positive significant effect of management quality ratio on return on asset. The findings indicated that credit risk management has significant impact on financial performance of commercial banks of Nepal. Gurung and Gurung (2022) investigated the factors determining profitability of Nepalese commercial banks. The study revealed that loan to deposit ratio has a significant positive impact on the return on assets and net interest margin of commercial banks. Likewise, the study concluded that negative coefficient of capital adequacy ratio provides threats against unanticipated losses. Budhathoki et al. (2020) examined the impact of assets quality, capital adequacy ratio, assets diversification and operating efficiency on banks' profitability. The results indicated that three predictor variables assets quality, operating efficiency, and capital adequacy ratio significantly affect bank profitability.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of CAMEL analysis 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 effect of CAMEL analysis on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio and loan to deposit ratio with the return on assets and return on equity 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 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	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	Prime Commercial Bank Limited	2014/15-2022/23	9
9	Rastriya Banijya Bank Limited	2014/15-2022/23	9
10	Sanima Bank Limited	2014/15-2022/23	9
11	Siddhartha Bank Limited	2014/15-2022/23	9
12	Standard Chartered Bank Nepal 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 profitability depends upon CAMEL analysis. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio and loan to deposit ratio. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 EQ_{it} + \beta_3 ME_{it} + \beta_4 EQ_{it} + \beta_5 LR_{it} + \beta_6 LTDR_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 EQ_{it} + \beta_3 ME_{it} + \beta_4 EQ_{it} + \beta_5 LR_{it} + \beta_6 LTDR_{it} + e_{it}$$

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 shareholder's equity, in percentage.

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

AQ = Asset quality as measured by the ratio of total non-performing loan by total loans, in percentage.

ME = Management efficiency is measured as the ratio of operating expenses by operating income, in percentage.

EQ = Earning quality is measured as earnings per share, in Rs.

LR = Liquidity ratio as measured by the ratio of liquid assets to total assets, 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:

Capital adequacy ratio

Capital adequacy ratio is the ratio determined by regulatory authority in the banking sector. Assfaw (2018) assessed the determinants of the financial performance of private commercial banks in Ethiopia. The study showed that capital adequacy has positive and statistically significant effect on financial performance. Likewise, Ogboi and Unuafé (2013) showed that credit risk management and capital adequacy ratio have a positive impact on financial performance. Furthermore, Imani (2017) stated that capital adequacy ratio has significant positive effect on profitability (ROA). Likewise, Moussa (2015) found that there is a positive relationship between capital ratio and financial performance. Moreover, Barus et al. (2017) stated that capital adequacy is positively related to performance, as measured by return on assets (ROA) and return on equity (ROE). Based on it, the study develops following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and bank performance.

Asset quality

Asset quality is measured by non-performing to total loan ratio. The quality of loan portfolio determines the profitability of banks. Sangmi and Nazir (2010) found that lower the non-performing ratio, better would be the performance. Low nonperforming loans to total loans shows the good health of the portfolio a bank. Esther et al. (2010) revealed a negative relationship between non-performing loan and profitability. According to Achou and Tenguh (2008), non-performing loans (NPL) has an inverse relationship with banks' profitability. Pham (2013) found that NPLs has a significant negative correlation with banks' profitability. Kwashie (2022) showed that the non-performing loans have a negative impact on the measures of financial performance. Based on it, the study develops following hypothesis:

H₂: There is a negative relationship between asset quality ratio and bank performance.

Management efficiency

It is difficult to determine the sound performance of management of the bank as it is qualitative factor. To determine the soundness, the management efficiency is measured as operating expenses to operating income. Akbas (2012) found that higher the operating cost relatively to bank incomes, lower

will be bank profitability. Almazari (2013) observed that there is an inverse relationship between the cost income ratio and the bank's profitability. The reduction in cost leads to increase in profit, and thus increases return on equity. Moreover, Harsono (2024) found significant positive impact of management efficiency on financial performance. Furthermore, Uddin (2022) revealed that management inefficiency has a negative and insignificant impact on profitability. Based on it, the study develops following hypothesis:

H₃: There is a positive relationship between management efficiency and bank performance.

Earning quality

The quality of earning is a very important criterion that determines the ability of a bank to earn consistently, going into the future. It basically determines the profitability of the bank. Balaputhiran (2014) found a positive significant correlation between earnings per share and firm performance. Ebrahimi and Arezzo (2011) revealed that the majority of stockholders, investors and other stakeholders give priority to watch movements of earning information of a company and thus earning per share is an important factor for the firm performance. Islam and Shohidul (2018) found earning quality have positive impact on performance of bank. Singh and Milan (2023) found earning has positive impact on bank's performance. Similarly, Trung (2021) found that banks' performance is positively affected by earnings per share. Based on it, the study develops following hypothesis:

H₄: There is a positive relationship between earning quality and bank performance.

Liquidity ratio

Liquidity position is measured by the liquid assets to total assets. Similarly, Fungacova and Poghosyan (2011) found a significant positive relationship between bank's liquidity and profitability. However, Sufian (2011) found that bank with higher liquidity levels tend to have less profitability. Bhunia and Khan (2011) found that there is positive and significant relationship between bank profitability and liquidity. Ebrahimi et al. (2017) examined the impact of CAMEL indexes on profit management in banks listed on Tehran Stock Exchange. The study showed that liquidity has a positive and significant effect on banks' profit management. Echekeba et al. (2014) analyzed the determinants of bank profitability in Nigeria using CAMEL rating model. The study showed that liquidity has a significant positive impact on banks profitability. Tibebe (2020) found financial performance is significantly affected by liquidity position of private commercial bank. Based on it, the study develops following hypothesis:

H₅: There is a positive relationship between liquidity and bank performance.

Loan to deposit ratio

Loan to total deposit ratio refers to the funds that a bank has utilized into loans from the collected deposits. Ulandari et al. (2016) found that loan to deposit ratio has a positive effect on profitability. Moreover, Shafana (2015) found that credit to deposit ratio has a significant positive effect on profitability of financial institutions. Likewise, Bolek and Wilinski (2012) found that credit to deposit ratio has a positive impact on the profitability. Similarly, Rengasamy (2014) found that there exists a positive and significant impact of credit to deposit ratio on return on assets. Similarly, Sari et al. (2017) found that loan to deposit ratio (LDR) partially has positive but not significant effect on return on assets (ROA). Jeslin (2017) investigated the impact of credit risk on the profitability of the bank. The study found positive impact of loan to deposit ratio on return on equity. Based on it, the

study develops following hypothesis:

H_6 : There is a positive relationship between loan to deposit and bank performance.

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 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 profit to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of capital to risk weighted assets, in percentage), AQ (Asset quality as measured by the ratio of total non-performing loan by total loans, in percentage), ME (Management efficiency is measured as the ratio of operating expenses by operating income, in percentage), EQ (Earning quality is measured as earnings per share, in Rs.), LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, 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
ROA	0.47	3.22	1.62	0.54
ROE	3.78	33.11	15.12	5.16
CAR	7.49	22.99	13.94	2.54
AQ	0.01	5.35	1.66	1.40
ME	20.35	78.25	41.01	8.52
EQ	5.30	78.83	28.01	12.92
LR	6.80	14.42	10.38	1.90
LTDR	48.92	107.01	83.40	9.59

Source: SPSS version 22

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 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 income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of capital to risk weighted assets, in percentage), AQ (Asset quality as measured by the ratio of total non-performing loan by total loans, in percentage), ME (Management efficiency is measured as the ratio of operating expenses by operating income, in percentage), EQ (Earning quality is measured as earnings per share, in Rs.), LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage) and LTDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage).

Variables	Mean	SD	ROA	ROE	CAR	AQ	ME	EQ	LR	LTDR
ROA	1.622	0.537	1							
ROE	15.117	5.162	0.492**	1						
CAR	13.942	2.544	0.310**	-0.190*	1					
AQ	1.654	1.404	0.041	-0.155	-0.053	1				
ME	41.010	8.521	-0.234*	-0.261**	-0.094	0.479**	1			
EQ	28.072	12.926	0.554**	0.551**	-0.010	0.140	-0.11	1		
LR	10.372	1.896	0.029	-0.296**	0.290**	0.381**	0.316**	-0.191*	1	
LTDR	83.405	9.585	-0.192*	-0.331**	0.058	-0.079	0.036	-0.210*	0.068	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 the increase in capital adequacy ratio leads to increase in return on assets. Similarly, there is a positive relationship between assets quality and return on assets. It means that higher the nonperforming loans, higher would be the return on assets. In addition, management efficiency has a negative relationship with return on assets. It means that increase in operating expense ratio leads to decrease in return on assets. Furthermore, there is a positive relationship between earning quality and return on assets. It indicates that increase in earning quality leads to increase in return on assets. Similarly, there is a positive relationship between liquidity ratio and return on assets. It indicates that increase in liquidity ratio leads to increase in return on assets. In addition, loan to deposit ratio has a negative relationship with return on assets. It means that increase in loan to deposit ratio leads to decrease in return on assets.

Likewise, the table also shows that capital adequacy ratio has a negative relationship with return on equity. It indicates that the increase in capital adequacy ratio leads to decrease in return on equity. Similarly, there is a negative relationship between assets quality and return on equity. It means that higher the nonperforming loans, lower would be the return on equity. In addition, management efficiency has a negative relationship with return on equity. It means that increase in operating expense ratio leads to decrease in return on equity. Furthermore, there is a positive relationship between earning quality and return on equity. It indicates that increase in earning quality leads to increase in return on equity. Similarly, there is a negative relationship between liquidity ratio and return on equity. It indicates that increase in liquidity ratio leads to decrease in return on equity. In addition, loan to deposit ratio has a negative relationship with return on equity. It means that increase in loan to deposit 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 capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio and loan to deposit ratio on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio and loan to deposit 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 $ROA = \beta_0 + \beta_1 CAR_{it} + \beta_2 EQ_{it} + \beta_3 ME_{it} + \beta_4 EQ_{it} + \beta_5 LR_{it} + \beta_6 LTDR_{it} + e_{it}$, 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 CAR (Capital adequacy ratio as measured by the ratio of capital to risk weighted assets, in percentage), AQ (Asset quality as measured by the ratio of total non-performing loan by total loans, in percentage), ME (Management efficiency is measured as the ratio of operating expenses by operating income, in percentage), EQ (Earning quality is measured as earnings per share, in Rs.), LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, 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
		CAR	AQ	ME	EQ	LR	LTDR			
1	0.711 (2.575)	0.065 (3.356)						0.088	0.512	11.263
2	1.596 (19.872)		0.016 (0.426)					0.008	0.538	0.182
3	2.225 (8.936)			-0.015 (2.474)				0.046	0.524	6.120
4	0.976 (9.421)				0.023 (6.849)			0.301	0.448	46.912
5	1.537 (5.306)					0.008 (0.299)		0.009	0.538	0.090
6	2.517 (5.619)						-0.011 (2.011)	0.028	0.529	4.045
7	0.665 (2.323)	0.066 (3.375)	0.022 (0.625)					0.082	0.513	5.795
8	1.418 (3.782)	0.062 (3.257)	0.077 (1.986)	-0.019 (2.97)				0.146	0.495	7.090
9	0.543 (1.611)	0.064 (4.043)	0.027 (0.812)	-0.011 (2.085)	0.022 (6.871)			0.409	0.412	19.483
10	0.369 (1.006)	0.056 (3.35)	0.012 (0.353)	-0.012 (2.248)	0.023 (6.961)	0.03 (1.184)		0.411	0.411	15.928
11	0.798 (1.582)	0.057 (3.408)	0.009 (0.262)	-0.012 (2.197)	0.022 (6.655)	0.031 (1.226)	-0.005 (1.235)	0.414	0.410	13.596

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 Moussa (2015). Similarly, the beta coefficients for asset quality are positive with return on assets. It indicates that asset quality has a positive impact on return on assets. This finding is inconsistent with the findings of Kwashie (2022). Likewise, the beta coefficients for management efficiency are negative with return on assets. It indicates that management efficiency has a negative impact on return on assets. This finding is similar to the findings of Harsono (2024). 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 consistent with the findings of Jeslin (2017). In addition, the beta coefficients for earning quality are positive with return on assets. It indicates that earning quality has a positive impact on return on assets. This finding is similar to the findings of Ebrahimi and Arezzo (2011). Moreover, the beta coefficients for liquidity ratio are positive with return on assets. It indicates that liquidity ratio has a positive impact on return on assets. This finding is consistent with the findings of Bhunia and Khan (2011).

Table 5 shows the regression results of capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio and loan to deposit ratio on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, asset quality, management efficiency, earning quality, liquidity ratio 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 of 2014/15 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 CAR_{it} + \beta_2 EQ_{it} + \beta_3 ME_{it} + \beta_4 LR_{it} + \beta_5 LTDR_{it} + e_{it}$, 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 CAR (Capital adequacy ratio as measured by the ratio of capital to risk weighted assets, in percentage), AQ (Asset quality as measured by the ratio of total non-performing loan by total loans, in percentage), ME (Management efficiency is measured as the ratio of operating expenses by operating income, in percentage), EQ (Earning quality is measured as earnings per share, in Rs.), LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, 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
		CAR	AQ	ME	EQ	LR	LTDR			
1	20.734 (7.576)	-0.403 (2.086)						0.030	5.082	4.351
2	16.057 (21.02)		-0.568 (1.611)					0.015	5.123	2.595
3	21.736 (9.153)			-0.161 (2.846)				0.062	4.998	8.101
4	8.937 (8.944)				0.220 (6.804)			0.297	4.326	46.295
5	23.476 (8.819)					-0.806 (3.192)		0.079	4.953	10.186
6	29.977 (7.234)						-0.178 (3.609)	0.101	4.89376	13.028
7	21.989 (7.844)	-0.421 (2.196)	-0.609 (1.754)					0.049	5.033	3.757
8	28.43 (7.668)	-0.458 (2.447)	-0.137 (0.356)	-0.163 (2.569)				0.097	4.904	4.838
9	19.512 (5.941)	-0.437 (2.848)	-0.65 (2.009)	-0.085 (1.594)	0.223 (8.184)			0.393	4.022	18.298
10	19.861 (5.517)	-0.423 (2.556)	-0.621 (1.792)	-0.083 (1.53)	0.221 (6.861)	-0.06 (0.242)		0.387	4.040	14.516
11	29.563 (6.177)	-0.403 (2.521)	-0.693 (2.07)	-0.076 (1.455)	0.205 (6.489)	-0.038 (0.157)	-0.119 (2.945)	0.430	3.896	14.452

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 negative with return on equity. It indicates that capital adequacy ratio has a negative impact on return on equity. This finding is similar to the findings of Barus et al. (2017). Similarly, the beta coefficients for asset quality are negative with return on equity. It indicates that asset quality has a negative impact on return on equity. This finding is consistent with the findings of Sangmi and Nazir (2010). Likewise, the beta coefficients for management efficiency are negative with return on equity. It indicates that management efficiency has a negative impact on return on equity. This finding is similar to the findings of Akbas (2012). Further, 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 Bolek and Wilinski (2012). In addition, the beta coefficients for earning quality are positive with return on equity. It indicates that earning quality has a positive impact on return on equity. This finding is similar to the findings of Trung (2021). Moreover, the beta coefficients for liquidity ratio are negative with return on equity. It indicates that liquidity ratio has a negative impact on return on equity. This finding is consistent with the findings of Echeboba et al. (2014).

4. Summary and conclusion

Banking sector plays a vital role in the economic growth. Sound financial well-being of a bank is the assurance not only to its investors, but is equally important for the owners, personnel and the whole economy as well. As a result, efforts have been made from time to time, to gauge the money related position of every bank and oversee it proficiently and viably. An effort has been made to assess the financial performance of the twelve commercial banks operating in Nepal.

This study attempts to analyse the effect of CAMEL analysis on the 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, asset quality, management efficiency, liquidity ratio and loan to deposit ratio have negative effect on return on equity of Nepalese commercial banks. Moreover, management efficiency and loan to deposit ratio have negative effect on return on assets of Nepalese commercial banks. Moreover, earning quality has positive effect on both return on assets and return on equity. It implies that high earning quality implies that the profits generated are sustainable, reliable, and derived from the core operations of the business. It reflects accurate and transparent financial reporting, strong revenue streams, and efficient cost management. The study also concluded that inefficiencies in management practices, suboptimal liquidity levels, and an imbalanced loan to deposit ratio contribute to reduced profitability for these banks. It also shows that an excessive focus on loan issuance without a corresponding increase in deposits can strain the bank's financial resources, leading to higher funding costs and credit risks, thereby negatively impacting return on equity in the context of Nepalese commercial banks.

References

- Achou, T. F., and N. C. Tenguh, 2008. Bank performance and credit risk management. *Research Journal of Finance and Accounting* 3(7), 116-124.
- Akbas, H. E., 2012. Determinants of bank profitability: An investigation on the Turkish banking sector. *Journal of Economics* 3(1), 103-110.
- Almazari, A. A., 2013. Capital adequacy, cost income ratio and the performance of Saudi banks. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 3(4), 284-293.
- Assfaw, A. M., 2018. Determinants of the financial performance of private commercial banks in Ethiopia: bank specific factors analysis. *Global Journal of Management and Business Research: Corporate Finance* 18(3), 55-67.
- Balaputhiran, S., 2014. Firm performance and earning per share: A study of listed banks in Sri Lanka. *Merit Research Journal of Accounting, Auditing, Economics and Finance*, 2(1), 008-011.
- Barus, J. J., W. Muturi, P. Kibati, and J. Koima, 2017. Effect of management efficiency on financial performance of savings and credit societies in Kenya. *Journal of Strategic Management* 2(1), 92-104.
- Ben Lahouel, B., L. Taleb, Y. Ben Zaied, and S. Managi, 2024. Financial stability, liquidity risk and income diversification: evidence from European banks using the CAMELS-DEA approach. *Annals of Operations Research* 334(1), 391-422.
- Bhatti, M. A., M. Sadiq, A. N. Albarq, and A. S. Juhari, 2022. Risk Management and Financial Performance of Banks: An Application of CAMEL Framework. *Cuadernos de Economía* 45(128), 113-123.

- Bhunja, A., and I. U. Khan, 2011. Liquidity management efficiency of India steel companies: A case study. *Far East Journal of Psychology and Business* 3(1), 3-13.
- Bolek, M., and W. Wilinski, 2012. The influence of liquidity on profitability of polish construction sector companies. *Financial Internet Quarterly e-Finanse* 8(1), 38-52.
- Budhathoki, P. B., C. K. Rai, K. P. Lamichhane, G. Bhattarai, and A. Rai, 2020. The impact of liquidity, leverage, and total size on banks' profitability: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 545-555.
- Ebrahimi, M. C., and A. N. Arezzo, 2011. Credit management and corporate profitability in Nigeria. *Journal of Accountancy* 3(1), 22-28.
- Ebrahimi, S. K., A. Bahraminasab, and F. S. Seyedi, 2017. The impact of CAMEL indexes on profit management in banks listed on Tehran stock exchange. *International Review of Management and Marketing* 7(2), 421-429.
- Echekoba, F. N., C. F. Egbunike, and G. K. Ezu, 2014. Determinants of bank profitability in Nigeria: using camel rating model (2001-2010). *Journal of Business and Management* 16(9), 44-50.
- Esther, L., N. J. Matthew, and A. A. Angela, 2010. Non-performing loan and bank profitability: Evidence from an emerging market. *African Journal of Economic and Management Study* 7(4), 112-132.
- Fungacova, Z., and T. Poghosyan, 2011. Determinants of bank interest margins in Russia: Does bank ownership matter? *Journal of international Business and economics Research* 35(4), 22-35.
- Gurung, J. B., and N. Gurung, 2022. Factors determining profitability of commercial banks: Evidence from Nepali banking sector. *Prithvi Academic Journal* 6(1), 100-113.
- Harsono, I., 2024. The influence of risk, management quality, company size and bank liquidity on banking financial performance (2018-2022). *Economics Studies and Banking Journal* 1(1), 26-36.
- Islam, M., and M. Shohidul, 2018. Use of CAMEL rating framework: A comparative performance evaluation of selected Bangladeshi private commercial banks. *International Journal of Economics and Finance* 10(1), 120-128.
- Jeslin, S. J., 2017. A study on the impact of credit risk on the profitability of State Bank of India (SBI). *ICTACT Journal on Management Studies* 3(2), 538-542.
- Kafle, R., 2023. Impact of credit risk management on profitability of Nepalese commercial banks. *International Journal of Finance and Commerce* 5(1), 32-39.
- Khanal, P., and P. Sapkota, 2023. Credit risk management and its impact on performance of commercial banks: With reference to Nepal. *International Journal of Credit and Commerce* 5(1), 68-74.
- Kumar, M. S., A. P. Kumar, and A. Parvesh, 2013. A CAMEL model analysis of state bank group. *World Journal of Social Sciences* 3(4), 36-55.
- 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.
- Moussa, M. A. B., 2015. The determinants of bank liquidity: Case of Tunisia. *International Journal of Economics and Financial Issues* 5(1), 249-259.
- Nguyen, A. H., H. T. Nguyen, and H. T. Pham, 2020. Applying the CAMEL model to assess performance of commercial banks: Empirical evidence from Vietnam. *Banks and Bank Systems* 15(2), 177-186.

- Ogboi, C., and O. K. Unuafefe, 2013. Impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking* 2(3), 703-717.
- Ping, K. G., and S. Kusairi, 2020. Analysis of CAMEL components and commercial bank performance: Panel data analysis. *Jurnal Organisasi Dan Manajemen* 16(1), 1-10.
- Rauf, A. L., 2016. Towards increasing the financial performance: An application of CAMEL Model in banking sector in the context of Sri Lanka. *Research Journal of Finance and Accounting* 7(5), 66-71.
- Rengasamy, D., 2014. Impact of loan deposit ratio (LDR) on profitability: Panel evidence from commercial banks in Malaysia. *Global Economics, Finance and Social Sciences* 1(1), 1-12
- Sangmi, M. U. D., and T. Nazir, 2010. Analyzing financial performance of commercial banks in India: Application of CAMEL Model. *Pakistan Journal of Commerce and Social Sciences* 4(1), 40-55.
- Sarakiri, J. A., 2023. Risk and bank profitability: New evidence from Nigeria. *African Banking and Finance Review Journal* 6(6), 36-45.
- Setiawan, Y., and M. Nupus, 2021. The effect of capital adequacy ratio and loan to deposit ratio on banking profitability. *Bina Bangsa International Journal of Business and Management* 1(1), 79-89.
- Shafana, M., 2015. Liquidity and profitability of financial institutions in Sri Lanka. *International Journal of Science and Research* 4(6), 589-593.
- Singh, Y., and R. Milan, 2023. Analysis of financial performance of public sector banks in India: CAMEL. *Arthaniti: Journal of Economic Theory and Practice* 22(1), 86-112.
- Sufian, F., 2011. Profitability of the Korean banking sector: Panel evidence on bank-specific and macroeconomic determinants. *Journal of Economics and Management* 7(1), 43-72.
- Tibebe, A. N., and T. M. S. Gujral, 2022. Determinants of profitability of commercial banks in Ethiopia: A study on internal factors. *Journal of Positive School Psychology* 6(8), 1219-1238.
- Tibebe, A. N., 2020. Determinants of financial performance of private commercial banks in Ethiopia: Camel approach. *International Journal of Research in Business Studies and Management* 7(4), 25-34.
- Trung, N. K., 2021. Determinants of bank performance in Vietnamese commercial banks: an application of the CAMELS model. *Cogent Business and Management* 8(1), 197-203.
- 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.
- Zagherd, M. K. W., and M. Barghi, 2017. Performance evaluation of Iranian banking industry through CAMELS framework. *Journal of Accounting and Marketing* 6(2), 1-7.

Chapter 12

Determinants of the Solvency in Insurance Companies of Nepal

Sagar Nath Pant*

Abstract

This study examines the determinants of the solvency in insurance companies of Nepal. Solvency risk (SR) and provision for unexpired risk (PUR) are the selected dependent variables. The selected independent variables are liquidity, company size, company age, volume of assets, claim ratio, and premium growth. The study is based on secondary data of 17 insurance companies with 102 observations for the study period from 2017/18 to 2022/23. The data were collected from Insurance Supervision Report published by Nepal Insurance Authority (NIA) and annual reports of the selected insurance companies. The correlation coefficients and regression models are estimated to test the significance and importance of different factors on the solvency in Nepalese insurance companies.

The study showed that company size has a positive effect on solvency risk and provision for unexpired risk. It indicates that increase in company size leads to decrease in solvency risk and provision for unexpired risk. Moreover, company age has a positive effect on solvency risk and provision for unexpired risk. It indicates that increase in company age leads to increase in solvency risk and provision for unexpired risk. In addition, claim ratio has a positive effect on solvency risk. It indicates that increase in claim ratio leads to increase in solvency risk. Moreover, premium growth has a positive effect on solvency risk. It indicates that higher the premium growth, higher would be the solvency risk. Similarly, the result also showed that liquidity has a positive effect on provision for unexpired risk. It indicates that increase in liquidity leads to increase in provision for unexpired risk. In contrast, the study showed that premium growth has a negative effect on provision for unexpired risk. It indicates that higher the premium growth, lower would be the provision for unexpired risk.

Keywords: liquidity, company size, company age, volume of assets, claim ratio, and premium growth, solvency risk, provision for unexpired risk

1. Introduction

Solvency is defined as the ability of a company to fulfil its financial obligations in either the short term or the long term. Solvency risk is exceptionally significant for the insurance sector, as it pertains to the ability of an insurance company to meet its long-term financial obligations and policyholder claims. If an insurer fails to manage its solvency risk effectively, it can lead to insolvency, jeopardizing the financial stability of the company and potentially causing significant financial losses for policyholders, stakeholders, and the broader financial system. Maintaining adequate solvency is crucial for sustaining trust and confidence in the insurance market. Regulatory bodies impose strict solvency requirements and capital adequacy standards to ensure that insurance companies are resilient to financial shocks and capable of honoring their commitments. Effective risk management practices, sound investment strategies, robust capital reserves, and prudent underwriting are essential components in mitigating solvency risk and ensuring the long-term viability and stability of insurance companies (Jawad and Ayyash, 2019). The insurance industry plays a major role in the society as they stimulate the economy at large. This is because the sector is part of immune and repair system of an economy

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

and successful operation of the industries and development of an economy (Yuvaraj and Abate, 2013). Indeed, the role of financial institutions and in particular well-developed insurance industry in a country's economy is undoubtedly important as it provides long term fund for investors and companies and provide security for their investment. Insurance companies provide unique financial services to the growth and development of every economy. Such specialized financial services range from the underwriting of risks inherent in economic entities and the mobilization of large amount of funds through premiums for long term investments. Insurance, as a device for handling the financial aspects of risk, is feasible because insurance is able to combine the risks of individuals into groups and pay losses with funds collected from its members.

Horobet *et al.* (2021) examined the solvency risk and corporate performance of European retailers. The study found that the volatility of liquidity levels is an important predictor of solvency risk. Hence, sustaining a stable and good level of liquidity supports lower risks of financial distress, and may mitigate the shock impacts. The study also found that a higher solvency risk is accompanied by increased efficiency of asset use, but reduced profitability levels, which lead to higher returns available to shareholders for high solvency risk. Similarly, Dahiya *et al.* (2021) analyzed the impact of liquidity and solvency management on the financial performance of Jordanian manufacturing companies listed on the Amman Stock Exchange, for a period of 10 years from 2010 to 2019. The results showed a statistically significant impact of liquidity and solvency management and the size of the company on financial performance, while the liquidity has an insignificant reverse impact on financial performance. With respect to other variables, there is a significant positive impact of size on performance and a significant negative impact of solvency on performance. Likewise, Sakouvogui and Shaik (2020) investigated the importance of financial liquidity and solvency on US commercial and domestic banks' cost efficiency. The results showed that the financial liquidity and solvency negatively impact the cost efficiency of US commercial and domestic banks. The importance of financial solvency on the cost efficiency was not statistically significant. Permana *et al.* (2023) examined the effect of solvency on firm size. The results showed that solvency has a significant impact on firm size. The study also showed that tax avoidance has a significant impact on firm size. Similarly, Afifah *et al.* (2021) examined the determinant of solvency on Sharia Life Insurance in Indonesia. The results showed that company size has a significant and positive impact on premium growth. Further, Derbali and Lamouchi (2021) assessed the determinants of the performance of Tunisian insurance companies. The empirical results showed that only the microeconomic factors determine the performance of insurance companies. The macroeconomic factors have no significant impact on performance. Capital structure, solvency, risk capital management, premium growth, volume of capital, age and financial investments are the determinants of the performance of Tunisian insurance companies.

The solvency ratio of insurance companies is determined by a multitude of factors, reflecting both internal management practices and external economic conditions. According to Cummins and Nini (2002), the key determinants include the quality and diversification of the investment portfolio, as a well-managed and diversified portfolio can mitigate risks and enhance returns, thus supporting solvency. Capital adequacy is another critical factor, as a robust capital base provides a buffer against potential losses. The underwriting performance, reflecting the company's ability to accurately price risks and manage claims, directly impacts solvency by influencing profitability and reserve adequacy. Similarly, Adams and Buckles (2003) examined the determinants of operational performance in Bermuda insurance during 1993-1997 by considering 47 insurance companies. The findings indicated that company size and scope of activities have no substantial impact on the performance of insurance companies. Likewise, Shiu (2004) assessed the determinants of the performance of insurance companies in the United Kingdom between 1986 and 1999. The results showed that performance of insurance companies is positively correlated to interest rate, liquidity, solvency margin, and return on

equity and negatively related to inflation and reinsurance dependence. Further, Malik (2011) examined the determinants of insurance performance in Pakistan during the period 2005-2009. The results confirmed that capital size and volume positively affect insurance performance, while the leverage and loss ratio exert adverse impact on return on assets. In addition, Kozak (2011) analyzed the profitability of 25 Polish non-life insurance companies between 2002 and 2009. The empirical study showed that amount of gross written premiums has a significant and positive impact on the profitability of insurance companies. Similarly, Moro and Anderloni (2014) investigated the influence of specific factors on insurance performance in 198 European insurance companies between 2002 and 2014. The results revealed that asset size and diversification negatively affect return on assets, while reserves dimension and asset turnover positively impact on return on assets. Likewise, Burca and Batrinca (2014) suggested that the insurance performance is affected by some specific factors, such as financial leverage, company size, growth of gross written premiums, underwriting risk ratio, and solvency margin. Further, Yuvaraj and Abate (2013) concluded that the insurance firms' profitability is positively affected by the size and volume of capital, while liquidity ratio and leverage ratio negatively affect the insurance profitability. In addition, Mehari and Aemiro (2013) showed that the size, risk ratio, leverage, and tangibility are the important determinants of insurance performance in Ethiopia. On the other hand, growth in writing premium, age, and liquidity have a statistically insignificant impact on return on assets.

According to Kripa and Ajasllari (2016), regulatory frameworks and compliance requirements also play a significant role, as stringent regulations ensure that insurers maintain sufficient capital and reserves. Economic conditions, such as interest rates and inflation, affect investment returns and liabilities, thereby influencing solvency. Additionally, the company's reinsurance strategy, which involves transferring portions of risk to other insurers, can enhance financial stability and protect against large losses. Effective risk management practices, including proper assessment and mitigation of underwriting, operational, and market risks, are crucial for maintaining a strong solvency ratio. Lastly, corporate governance and management quality, encompassing strategic decision-making and operational efficiency, are fundamental to sustaining financial health and solvency in insurance companies. Similarly, Ortynski (2016) found that insurance performance negatively responds to net claims ratio and net operating expenses, while profitability is positively affected by company size the ratio of technical activity. Likewise, Derbali and Jamel (2018) exhibited that firm-level determinants of profitability in 19 Tunisian insurance companies and concluded that the age and premium growth rate positively affect return on assets, while the size is negatively correlated to the performance of Tunisian insurance companies. In addition, Abebe and Abera (2019) examined the determinants of financial performance in the Ethiopian Insurance market during 2010-2015. The study indicated that capital adequacy, liquidity, size, age, loss, and leverage are the major determinants of financial performance. Moreover, Guendouz and Ouassaf (2018) examined the factors affecting the performance of six insurance companies in Saudi Arabia between 2010 and 2016. The empirical analysis indicated that the age, size, premium growth rate, and loss ratio have significant impact on the profitability of insurance companies. Likewise, Akhtar (2018) analyzed the performance of insurance companies in Saudi Arabia over the period 2010-2015. The study suggested that the efficiency of Saudi insurance companies is affected by the market share and profitability.

In the context of Nepal, the role of insurance companies is broad. Despite the sector still being in its infancy, its growth potential is huge. Poudel (2019) examined the effect of ownership as well as various firm-specific factors that determine the profitability of insurance companies. The study disclosed a negative relation of tangibility and liquidity with return on asset. However, firm size, age and leverage have positive relationship with return on asset. Similarly, Bhattarai (2020) assessed the factors influencing profitability of insurance companies in Nepal. The study concluded that financial leverage and size are the major determinants of the profitability in Nepalese insurance companies.

The above discussion shows that empirical evidences vary greatly across the studies on the determinants of the solvency in 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 determinants of the solvency in insurance companies of Nepal. Specifically, it examines the relationship of liquidity, company size, company age, volume of assets, claim ratio, and premium growth with solvency in insurance companies 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 17 Nepalese insurance companies from 2017/18 to 2022/23, leading to a total of 102 observations. The main sources of data collected from the Insurance Supervision Report published by Nepal Insurance Authority (NIA) and annual reports 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.

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	Observations
Non-life insurance companies			
1	Nepal Insurance Company Limited	2017/18 to 2022/23	6
2	The Oriental Insurance Company Limited	2017/18 to 2022/23	6
3	National Insurance Company Limited	2017/18 to 2022/23	6
4	Neco Insurance Limited	2017/18 to 2022/23	6
5	Prabhu Insurance Limited	2017/18 to 2022/23	6
6	Shikhar Insurance Company Limited	2017/18 to 2022/23	6
7	NLG Insurance Limited	2017/18 to 2022/23	6
8	Sanima GIC Insurance Limited	2017/18 to 2022/23	6
Life insurance companies			
9	National Life Insurance Company Limited	2017/18 to 2022/23	6
10	Nepal Life Insurance Company Limited	2017/18 to 2022/23	6
11	Life Insurance Corporation (Nepal) Limited	2017/18 to 2022/23	6
12	MetLife (ALICO)	2017/18 to 2022/23	6
13	Asian Life Insurance Company Limited	2017/18 to 2022/23	6
14	IME Life Insurance Company Limited	2017/18 to 2022/23	6
15	Reliable Nepal Life Insurance Company Limited	2017/18 to 2022/23	6
16	Citizen Life Insurance Limited	2017/18 to 2022/23	6
17	Sun Nepal Life Insurance Company Limited	2017/18 to 2022/23	6
Total number of observations			102

Thus, the study is based on the 102 observations.

The model

The model used in this study assumes that solvency depends upon liquidity, company size, company age, and volume of assets. The dependent variables selected for the study are solvency risk and provision for unexpired risk. Similarly, the selected independent variables are liquidity, company size, company age, volume of assets, claim ratio, and premium growth. Therefore, the models take the following forms:

$$SR = \beta_0 + \beta_1 LIQ + \beta_2 CS + \beta_3 CA + \beta_4 VA + \beta_5 CR + \beta_6 PG + e_{it}$$

$$PUR = \beta_0 + \beta_1 LIQ + \beta_2 CS + \beta_3 CA + \beta_4 VA + \beta_5 CR + \beta_6 PG + e_{it}$$

Where,

SR = Solvency risk as measured by the difference between liability and assets from, Rs. in billion.

PUR = Provision for unexpired risk as measured by portion of premium which in not matured with in fiscal year, in percentage.

LIQ = Liquidity as measured by cash and cash equivalent items, in percentage.

CS= Company size as measured by number of branches, in numbers.

CA= Company age as measured by establishment year of company, in numbers.

VA = Volume of assets as measured by the total assets, Rs. in billion.

CR = Claim ratio as measured by the ratio of policy claimed to total number of policy issued, in percentage.

PG = Premium growth as measured by annual change in total insurance premium income, in percentage.

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

Liquidity

A strong liquidity position supports solvency by ensuring that the company can meet immediate cash demands without having to sell long-term investments at unfavorable prices, which could lead to financial losses (Jawad and Ayyash, 2019). Adequate liquidity provides a cushion against short-term market volatility and unexpected large claims, contributing to overall financial stability. Conversely, insufficient liquidity can force an insurer to liquidate assets under duress, potentially realizing losses that weaken its capital base and threaten solvency (Guimaraes and Nossa, 2010). Lee and Urrutia (1996) found that the current ratio is a positive and significant indicator of solvency. The stability of the liquidity ratio is a necessary measure of corporate solvency. Liquidity ensures that an insurance company can quickly access cash or convert assets into cash to pay for short-term liabilities, such as policyholder claims and operational expenses. Meeting these obligations promptly prevents financial distress and supports ongoing operations, which is vital for maintaining solvency. Based on it, this study develops following hypothesis:

H₁: There is a positive relationship between liquidity and solvency of the insurance company.

Company size

Larger insurance companies often benefit from economies of scale, which can enhance their solvency. These economies of scale enable large insurers to spread their fixed costs over a greater volume of business, reducing per-unit costs and increasing profitability. Greater profitability, in turn, can bolster an insurer's capital base, improving its solvency position (Guimaraes and Nossa, 2010). Ilyas et al. (2023) assessed the financial distress and its determinants in insurance companies in Ethiopia. The results showed that profitability, firm size, leverage, and company age are negatively correlated to financial distress having a strong negative effect on financial distress. In addition, Mazviona *et al.* (2017) revealed that smaller insurance companies may have advantages such as more agility and the ability to operate in niche markets with specialized knowledge and closer customer relationships. They can also maintain solvency through prudent underwriting, effective risk management, and maintaining adequate capital reserves, even without the scale advantages of larger firms. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between company size and solvency of the insurance company.

Company age

Malik (2011) found an insignificant but positive impact of age of the company on profitability. Older insurance companies often have well-established reputations and greater trust among policyholders, which can lead to a more stable and loyal customer base. This stability helps maintain steady premium income, contributing to solvency. Similarly, Afza and Asghar (2012) examined the performance determinants for general insurers over the period 2004- 2009. The study found that size, investment, past performance and age are positively correlated with the performance of general insurers. Experience in the industry allows older companies to refine their underwriting practices, improve risk assessment, and develop more effective claims management strategies. This operational expertise reduces the likelihood of unexpected financial shocks and supports overall financial health. Further, Kramaric and Pavic (2017) assessed the determinants of insurance markets in selected central and eastern European countries. The study revealed that company age positively and significantly affect performance. Long-established companies are often more familiar with regulatory requirements and have developed robust compliance systems. Adherence to regulatory standards, including maintaining adequate capital and reserves, is essential for solvency. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between age and solvency of the insurance company.

Volume of assets

A well-capitalized insurance company is better positioned to withstand financial shocks and unexpected claims, thereby enhancing solvency. According to Malik (2011), a substantial asset base allows an insurance company to invest in a diversified portfolio, potentially generating higher investment income. This income can be used to cover claims, fund reserves, and support overall financial health. Higher investment returns contribute to profitability and strengthen the company's solvency position. Likewise, Hsiao and Whang (2009) examined the financial situation and monitor the solvency of selected samples in Taiwan. The study found that with more assets, an insurance company can build up its reserves and surplus. Reserves are critical for meeting future claims, while surplus provides an additional buffer against unexpected losses. Adequate reserves and surplus are key indicators of solvency. A larger asset base provides capital adequacy, investment income, reserves, risk diversification, regulatory compliance, financial flexibility, and operational stability, all of which are essential for maintaining solvency (Ramlall, 2009). However, the quality and management of these

assets are critical to sustaining this positive relationship. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between volume of assets and solvency of the insurance company.

Premium growth

There is a positive relationship between premium growth and the solvency of an insurance company, as growing premiums can enhance the company's financial stability and ability to meet its long-term obligations. Premium growth generally indicates an expanding customer base and increasing revenue, which can contribute to a stronger capital position and improved solvency. Guendouz and Ouassaf (2018) concluded that written premium growth rate has a significant and positive impact on the profitability of insurance companies. Similarly, Hussanie and Joo (2019) revealed that premium growth and tangibility are positive and significant in determining the profitability, as measured by return in assets. Likewise, Markonah *et al.* (2019) found that higher premium growth will improve the financial performance of insurance companies and it is positively related with the performance. Further, Derbali and Jamel (2018) concluded that age and premium growth have a positive impact on performance of insurance in Tunisia. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between premium growth and solvency of the insurance company.

Claim ratio

A higher claim ratio indicates that a significant portion of the premiums is being used to pay claims, which can strain the company's financial resources. Likewise, Tarsono *et al.* (2020) found a negative and significant relationship between financial performance. When the claim ratio is high, it can negatively impact the insurer's profitability and, consequently, its solvency. Hasibuan *et al.* (2020) concluded that net claim ratio has a negative and significant relationship with profitability. High claims payouts reduce the available capital that the insurer can use for other purposes, such as investments, operational expenses, and building reserves. This can deplete the company's financial buffer, making it more vulnerable to financial instability and reducing its ability to meet long-term obligations. In addition, Bunyaminu *et al.* (2022) explored that net claim ratio has a negative and insignificant relationship with performance measured in term of return on assets and return on equity. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between claim ratio and solvency of the insurance company.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2017/18 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 17 insurance companies of Nepal for the study period of 2017/18 to 2022/23. The dependent variables are SR (Solvency risk as measured by the difference between liability and assets from, Rs. in billion) and PUR (Provision for unexpired risk as measured by portion of premium which in not matured with in fiscal year, in percentage). The independent variables are LIQ (Liquidity as measured by cash and cash equivalent items, in percentage), CS (Company size as measured by the total number of branches, in number), CA (Company age as measured by the numbers of years of company establishment, in year), VA (Volume of assets as measured by the total assets of company, Rs. in billions), CR (Claim ratio as measured by the ratio of claimed to total policy in a year, in percentage), and PG

(Premium growth as measured by annual change in total insurance premium income, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
PUR	0.00	543.00	99.76	137.07
SR	-29.35	-0.19	-3.29	3.71
LIQ	0.00	623.98	120.86	149.25
CS	1.00	199.00	84.50	50.28
CA	1.00	75.00	22.56	19.68
VA	0.73	99.46	14.96	20.62
CR	0.00	82.27	10.09	19.39
PG	-28.00	221.23	31.11	43.15

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 17 Nepalese insurance companies for the study period of 2017/18 to 2022/23. The dependent variables are SR (Solvency risk as measured by the difference between liability and assets from, Rs. in billion) and PUR (Provision for unexpired risk as measured by portion of premium which is not matured with in fiscal year, in percentage). The independent variables are LIQ (Liquidity as measured by cash and cash equivalent items, in percentage), CS (Company size as measured by the total number of branches, in number), CA (Company age as measured by the numbers of years of company establishment, in year), VA (Volume of assets as measured by the total assets of company, Rs. in billions), CR (Claim ratio as measured by the ratio of claimed to total policy in a year, in percentage), and PG (Premium growth as measured by annual change in total insurance premium income, in percentage).

Variables	PUR	SR	LIQ	CS	CA	VA	CR	PG
PUR	1							
SR	-0.043	1						
LIQ	0.323**	-0.063	1					
CS	0.07	-0.432**	-0.207*	1				
CA	0.177	0.056	0.234*	-0.339**	1			
VA	0.197*	-0.481**	0.08	0.340**	-0.039	1		
CR	-0.10	0.111	-0.003	-0.220*	-0.054	-0.258**	1	
PG	-0.202*	0.178	-0.167	0.064	-0.418**	-0.278**	-0.081	1

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

Table 3 shows that liquidity has a negative relationship with solvency risk. It indicates that increase in liquidity leads to decrease in solvency risk. Similarly, there is a negative relationship between company size and solvency risk. It indicates that increase in company size leads to decrease in solvency risk. However, there is a positive relationship between company age and solvency risk. It indicates that increase in company age leads to increase in solvency risk. In contrast, volume of assets has a negative relationship with solvency risk. It indicates that higher the volume of assets, lower would be the solvency risk. In addition, claim ratio has a positive relationship with solvency risk. It indicates that increase in claim ratio leads to increase in solvency risk. Moreover, the study shows that there is a positive relationship between premium growth and solvency risk. It indicates that higher the premium growth, higher would be the solvency risk.

Similarly, the result also shows that liquidity has a positive relationship with provision for unexpired risk. It indicates that increase in liquidity leads to increase in provision for unexpired risk. Similarly, there is a positive relationship between company size and provision for unexpired risk. It indicates that increase in company size leads to increase provision for unexpired risk. Likewise, the study also showed that there is a positive relationship between company age and provision for unexpired risk. It implies that increase in company age leads to increase in provision for unexpired risk. Furthermore, volume of assets has a positive relationship with provision for unexpired risk. It implies that higher the volume of assets, higher would be the provision for unexpired risk. In addition, claim ratio has a negative relationship with provision for unexpired risk. It indicates that higher the claim ratio, lower would be the provision for unexpired risk. Moreover, the study shows that there is a negative relationship between premium growth and provision for unexpired risk. It indicates that higher the premium growth, lower would be the provision for unexpired risk.

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 liquidity, company size, company age, volume of assets, claim ratio, and premium growth with solvency risk of insurance companies of Nepal.

Table 4

Estimated regression results of liquidity, company size, company age, volume of assets, claim ratio, and premium growth on solvency risk

The results are based on panel data of 17 Nepalese insurance companies with 102 observations for the period of 2017/18 to 2022/23 by using the linear regression model and the model is $SR = \beta_0 + \beta_1 LIQ + \beta_2 CS + \beta_3 CA + \beta_4 VA + \beta_5 CR + \beta_6 PG + e_{it}$ where, the dependent variable is SR (Solvency risk as measured by the difference between liability and assets from, Rs. in billion). The independent variables are LIQ (Liquidity as measured by cash and cash equivalent items, in percentage), CS (Company size as measured by the total number of branches, in number), CA (Company age as measured by the numbers of years of company establishment, in year), VA (Volume of assets as measured by the total assets of company, Rs. in billions), CR (Claim ratio as measured by the ratio of claimed to total policy in a year, in percentage), and PG (Premium growth as measured by annual change in total insurance premium income, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		LIQ	CS	CA	VA	CR	PG			
1	5.893 (2.931)**	-0.395 (2.175)*						0.036	0.504	4.730
2	1.657 (20.924)**		-0.191 (2.203)*					0.037	0.504	4.853
3	1.843 (3.736)**			0.024 (0.653)				0.006	0.515	0.427
4	2.837 (3.828)**				-0.015 (1.777)			0.021	0.508	3.159
5	1.580 (17.115)**					0.042 (0.747)		0.004	0.514	0.558
6	2.954 (14.215)**						0.032 (7.033)**	0.329	0.421	49.463
7	6.405 (3.247)**	-0.428 (2.408)*	-0.206 (2.434)*					0.082	0.492	5.445
8	7.588 (3.435)**	-0.483 (2.635)**	-0.201 (2.371)*	0.042 (1.180)				0.086	0.491	4.109
9	10.458 (4.258)**	-0.595 (3.222)**	-0.195 (2.361)*	0.031 (0.881)*	-0.021 (2.435)*			0.131	0.479	4.723
10	10.458 (4.258)**	-0.589 (3.184)**	-0.194 (2.343)*	0.037 (1.027)	-0.020 (2.400)*	0.042 (0.784)		0.127	0.480	3.886
11	9.443 (4.474)**	-0.473 (2.967)**	-0.044 (0.585)	0.035 (1.129)	-0.010 (1.374)	0.026 (0.553)	0.030 (5.984)**	0.363	0.410	10.405

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.
- Solvency risk is the dependent variable.

Table 4 shows that the beta coefficients for liquidity are negative with solvency risk. It indicates that liquidity has a negative impact on solvency risk. This finding contradicts with the findings of Guimaraes and Nossa (2010). Similarly, the beta coefficients for company size are negative with solvency risk. It indicates that company size has a negative impact on solvency risk. This finding is consistent with the findings of Ilyas et al. (2023). Likewise, the beta coefficients for company age are positive with solvency risk. It indicates that company age has a positive impact on solvency risk. This finding is similar to the findings of Kramaric and Pavic (2017). Further, the beta coefficients for volume of assets are negative with solvency risk. It indicates that volume of assets has a negative impact on solvency risk. This finding is inconsistent with the findings of Ramlall (2009). In addition, the beta coefficients for claim ratio are positive with solvency risk. It indicates that claim ratio has a positive impact on solvency risk. This finding contradicts with the findings of Hasibuan *et al.* (2020).

Table 5 shows the regression results of liquidity, company size, company age, volume of assets, claim ratio, and premium growth with provision for unexpired risk of insurance companies of Nepal.

Table 5

Estimated regression results of liquidity, company size, company age, volume of assets, claim ratio, and premium growth with provision for unexpired risk

The results are based on panel data of 17 Nepalese insurance companies with 102 observations for the period of 2017/18 to 2022/23 by using the linear regression model and the model is $PUR = \beta_0 + \beta_1 LIQ + \beta_2 CS + \beta_3 CA + \beta_4 VA + \beta_5 CR + \beta_6 PG + e_{it}$ where, the dependent variable is PUR (Provision for unexpired risk as measured by portion of premium which in not matured with in fiscal year, in percentage). The independent variables are LIQ (Liquidity as measured by cash and cash equivalent items, in percentage), CS (Company size as measured by the total number of branches, in number), CA (Company age as measured by the numbers of years of company establishment, in year), VA (Volume of assets as measured by the total assets of company, Rs. in billions), CR (Claim ratio as measured by the ratio of claimed to total policy in a year, in percentage), and PG (Premium growth as measured by annual change in total insurance premium income, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		LIQ	CS	CA	VA	CR	PG			
1	63.876 (16.641)**	0.297 (0.087)						0.096	130.35	11.671
2	83.55 (26.703)**		0.192 (0.272)					0.05	137.41	0.498
3	71.982 (20.481)**			1.231 (0.686)				0.022	135.58	3.225
4	445.56 (272.159)**				23.98 (11.954)**			0.029	135.09	4.024
5	106.9 (15.316)**					-0.708 (0.703)		0.928	137.057	1.012
6	119.698 (16.497)**						-0.641 (0.311)	0.031	134.92	4.243
7	27.361 (29.437)**	0.324 (0.088)	0.391 (0.262)					0.106	129.56	7.019
8	7.139 (35.929)**	0.298 (0.089)	0.529 (0.273)	1.161 (0.702)				0.122	128.44	5.675
9	352.01 (268.950)**	0.281 (0.09)	0.391 (0.292)	1.108 (0.7)	15.825 (12.231)**			0.128	127.99	4.704
10	332.64 (278.389)**	0.281 (0.9)	0.375 (0.298)	1.082 (0.709)	15.144 (12.512)**	-0.201 (0.696)		0.120	128.61	3.744
11	233.16 (305.479)**	0.277 (0.09)	0.37 (0.299)	0.81 (0.788)	11.521 (13.332)**	-0.324 (0.714)	-0.283 (0.354)	0.116	128.85	3.215

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.
- Provision for unexpired risk is the dependent variable.

Table 5 shows that the beta coefficients for liquidity are positive with provision for unexpired risk.

It indicates that liquidity has a positive impact on provision for unexpired risk. This finding is similar to the findings of Lee and Urrutia (1996). Similarly, the beta coefficients for company size are positive with provision for unexpired risk. It indicates that company size has a positive impact on provision for unexpired risk. This finding is inconsistent with the findings of Mazviona *et al.* (2017). Likewise, the beta coefficients for company age are positive with provision for unexpired risk. It indicates that company age has a positive impact on provision for unexpired risk. This finding is similar to the findings of Kramaric and Pavic (2017). Further, the beta coefficients for volume of assets are positive with provision for unexpired risk. It indicates that volume of assets has a positive impact on provision for unexpired risk. This finding is consistent with the findings of Ramlall (2009). In addition, the beta coefficients for claim ratio are negative with provision for unexpired risk. It indicates that claim ratio has a negative impact on provision for unexpired risk. This finding is similar to the findings of Mazviona *et al.* (2017).

4. Summary and conclusion

Solvency risk is exceptionally significant for the insurance sector, as it pertains to the ability of an insurance company to meet its long-term financial obligations and policyholder claims. If an insurer fails to manage its solvency risk effectively, it can lead to insolvency, jeopardizing the financial stability of the company and potentially causing significant financial losses for policyholders, stakeholders, and the broader financial system.

This study attempts to analyze the determinants of the solvency in insurance companies of Nepal. The study is based on secondary data of 17 Nepalese insurance companies with 102 observations for the period from 2017/18 to 2022/23.

The major conclusion of this study is that liquidity, company size, and volume of assets have negative impact on solvency risk. It indicates that increase in liquidity, company size, and volume of assets leads to decrease in solvency risk. However, company age, claim ratio, and premium growth have positive impact on solvency risk. It indicates that higher the company age, claim ratio, and premium growth, higher would be the solvency risk. In contrast, liquidity, company size, company age, and volume of assets have positive impact on provision for unexpired risk. It indicates that increase in liquidity, company size, company age, and volume of assets leads to increase in provision for unexpired risk. In contrast, claim ratio and premium growth have negative impact on provision for unexpired risk. It indicates that higher the claim ratio and premium growth, lower would be the provision for unexpired risk. The study also concluded that claim ratio followed by premium growth is the most influencing factor that explains the changes in the solvency risk in the context of Nepalese insurance companies. Similarly, the study also concluded that volume of assets followed by company age is the most influencing factor that explains the changes in the provision for unexpired risk in the context of Nepalese insurance companies.

References

- Abebe, A. K., and M. T. Abera, 2019. Determinants of financial performance: evidence from Ethiopia insurance companies. *Journal of Accounting Finance and Auditing Studies* 5(1), 155–172.
- Adams, M., and M. Buckle, 2003. The determinants of corporate financial performance in the Bermuda insurance market. *Applied Financial Economics* 13(2), 133–143.
- Afiqah, Y. W., and N. Laila, 2021. The determinant Factors of Solvency on Sharia Life Insurance in Indonesia. *Jurnal Ekonomi Syariah Teori dan Terapan* 8(5), 530–536.
- Afza, T., and M. Asghar, 2012. Determinants of performance in the general insurers of Pakistan. *Actual Problems of Economics* 138(1), 286–292.
- Akhtar, M. H., 2018. Performance analysis of Takaful and conventional insurance companies in Saudi Arabia. *Benchmarking: An International Journal* 25(2), 677–695.
- 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.
- Bunyaminu, A., S. Bashiru, I. N. Yakubu, E. Aggrey, A. Appiah, and S. A. Tuffour, 2022. Claim management of non-life insurance companies in Ghana: does it impact on profitability. *Journal of Applied Economic*

- Sciences* 2(4), 97-106.
- Burca, A. M., and G. Batrinca, 2014. The determinants of financial performance in the Romanian insurance market. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 4(1), 299-308.
- Cummins, J. D., and G. P. Nini, 2002. Optimal capital utilization by financial firms: Evidence from the property-liability insurance industry. *Journal of Financial Services Research* 21(1), 15-53.
- Dahiyat, A. A., S. R. Weshah, and M. Aldahiyat, 2021. Liquidity and solvency management and its impact on financial performance: Empirical evidence from Jordan. *The Journal of Asian Finance, Economics and Business* 8(5), 135-141.
- Derbali, A. M. S., and A. Lamouchi, 2021. Determinants of the performance of insurance companies. *International Journal of Productivity and Quality Management* 34(2), 278-292.
- Derbali, A., and L. Jamel, 2018. Determinants of performance of Tunisia insurance companies: case of life insurance. *International Journal of Productivity and Quality Management* 24(4), 531-542.
- Guendouz, A. A., and S. Ouassaf, 2018. Determinants of Saudi takaful insurance companies' profitability. *Academy of Accounting and Financial Studies Journal* 22(5), 1-24.
- Guimaraes, A., and V. Nossa, 2010. Working capital, profitability, liquidity and solvency of healthcare insurance companies. *BBR-Brazilian Business Review* 7(2), 37-59.
- Hasibuan, A. F. P., I. Sadalia, and I. Muda, 2020. The effect of claim ratio, operational ratio and retention ratio on profitability performance of insurance companies in Indonesia Stock Exchange. *International Journal of Research and Review* 7(3), 223-231.
- Horobet, A., M. Radulescu, L. Belascu, and S. M. Dita, 2021. Determinants of bank profitability in CEE countries: Evidence from GMM panel data estimates. *Journal of Risk and Financial Management* 14(7), 307-317.
- Hsiao, S., and T. Whang, 2009. A study of a financial insolvency prediction model for life insurers. *Expert Systems with Applications* 3(6), 6100-6107.
- Hussanie, I., and B. A. Joo, 2019. Determinants of profitability of life insurers in India-panel evidence. *International Journal of Management Studies* 6(1), 58-65.
- Ilyas, A., G. Harini, and I. M. Pratama, 2023. The effect of profitability, company size and solvency on firm value insurance companies in IDX. *Journal Accounting Education and Finance* 1(1), 01-15.
- Jawad, Y. L. A., and I. Ayyash, 2019. Determinants of the solvency of insurance companies in Palestine. *International Journal of Financial Research* 10(6), 188-195.
- Kozak, S., 2011. Determinants of profitability of non-life insurance companies in Poland during integration with the European financial system. *Electronic Journal of Polish Agricultural Universities* 14(1), 1-9.
- Kramaric, T. P., M. Miletic, and I. Pavic, 2017. Profitability determinants of insurance markets in selected central and eastern European countries. *International Journal of Economic Sciences* 6(2), 100-123.
- Kripa, D., and D. Ajasllari, 2016. Factors affecting the profitability of insurance companies in Albania. *European Journal of Multidisciplinary Studies* 1(1), 35-65.
- Lee, S. H., and J. L. Urrutia, 1996. Analysis and prediction of insolvency in the property liability insurance industry: a comparison of logit and hazard models. *Journal of Risk and Insurance* 6(3), 121-130.
- Malik, H. 2011. Determinants of insurance companies' profitability: an analysis of insurance sector of Pakistan. *Academic Research International* 1(3), 315-322.
- Mazviona, B., M. Dube, and T. Sakahuhwa, 2017. An analysis of factors affecting the performance of insurance companies in Zimbabwe. *Journal of Finance and Investment Analysis* 6(1), 11-30.
- Mehari, L., and R. Aemiro, 2013. Firm specific factors that determine insurance companies' performance in

- Ethiopia. *European Scientific Journal* 9(10), 245-255.
- Moro, O., and L. Anderloni, 2014. Non-life insurance economic performances-an empirical investigation. *Journal of Economics and Management* 18(1), 159-166.
- Ortynski, K., 2016. Determinants of profitability of general insurance companies' performance in Poland. *Central European Review of Economics and Finance* 12(2), 53–66.
- Permana, R. M., 2023. Analysis of the financial performance of State-Owned Enterprises (SOES) in the mining sector listed on the Indonesia Stock Exchange In 2018-2022. *Indo-Fintech Intellectuals: Journal of Economics and Business* 3(2), 371-383.
- Poudel, B. 2019. Impact of ownership structure on the profitability of Nepalese insurance companies. *Nepalese Journal of Business* 6(3), 52-65.
- Ramlall, I., 2009. Bank-specific, industry-specific and macroeconomic determinants of profitability in Taiwanese banking system: under panel data estimation, *International Research Journal of Finance and Economics*, 34(1), 160-167.
- Sakouvogui, K., and S. Shaik, 2020. Impact of financial liquidity and solvency on cost efficiency: Evidence from US banking system. *Studies in Economics and Finance* 37(2), 391-410.
- Shiu, Y., 2004. Determinants of United Kingdom general insurance company performance. *British Actuarial Journal* 10(5), 1079–1110.
- Tarsono, O., P. A. Ardheta, and R. Amriyani, 2020. The influence of net premium growth, claim ratio and risk-based capital on the financial performance of life insurance companies. *In Annual International Conference on Accounting Research* 4(6), 65-68.
- Yuvaraj, S., and G. A. Abate, 2013. The performance of insurance companies in Ethiopia. *International Journal of Marketing, Financial Services and Management Research* 1(2), 138-150.

Chapter 13

Role of Accounting Information to Investors in the Stock Market: A case of Nepal

Yubraj Ojha*

Abstract

This study examines the role of accounting information to investors in the stock market in the context of Nepal. Stock return and stock price are the selected dependent variables. The selected independent variables are earnings per share, dividend per share, return on equity, book value per share, net profit margin and return on assets. The study is based on secondary data of 18 companies listed in Nepal Stock Exchange with 108 observations for the study period from 2017/18 to 2022/23. The data were collected from annual report of respective companies and website of Nepal Stock Exchange. The correlation coefficients and regression models are estimated to test the significance and importance of earnings per share, dividend per share, return on equity, book value per share, net profit margin and return on assets on the stock market in the context of Nepal.

The study showed that earnings per share has a positive effect on stock return and stock price. It means that increase in earnings per share leads to increase in stock return and stock price. Similarly, dividend per share has a positive effect on stock return and stock price. It indicates that increase in dividend per share leads to increase in stock return and stock price. Moreover, return on equity has a positive effect on stock return and stock price. It shows that higher the return on equity, higher would be the stock return and stock price. Likewise, book value per share has a positive effect on stock return and stock price. It means that increase in book value per share lead to increase in stock return and stock price. Similarly, net profit margin has a negative effect on stock return and stock price. It shows that higher the net profit margin, lower would be the stock return and stock price. Likewise, return on assets has negative effect on stock returns. It means that increase in return on assets leads to decrease in stock return. In contrast, return on assets have a positive effect on stock price. It means that increase in return on asset lead to increase in stock price.

Keywords: stock return, stock price, earnings per share, dividend per share, return on equity, book value per share, net profit margin, return on assets

1. Introduction

Investment in the capital market is becoming increasingly attractive to the public, particularly due to the potential for high returns associated with stocks, despite the high risks involved. Investors are drawn to the capital market by the prospect of these attractive returns, prompting them to diligently gather and analyze information on company performance to inform their investment decisions. However, an investor's assessment of a company does not exist in a vacuum; it significantly influences market confidence levels. Positive evaluations can bolster confidence, leading to increased demand for a company's stock and a subsequent rise in its price. Conversely, negative assessments can erode confidence, resulting in decreased demand and a fall in stock prices. This interplay between investor perception and market confidence contributes to the inherent volatility of stock prices, as they fluctuate in response to changing evaluations and sentiments within the market (Siawan and Lukman, 2023). Accounting data provide critical information to shareholders and investors as far as the company's past performance is concerned and are used extensively in forecasting future performance and valuations of

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

equity (Mlonzi *et al.*, 2011). Lawrence (2013) found that individual investors invest more in companies with clear and sufficient financial accounting information. Financial accounting information assists the investors in selecting the best portfolio for their investment. The purpose of financial statements is to provide information about financial positions, performance, and changes in financial position of an entity that is helpful for users to make economic decisions (Hai *et al.*, 2015). Safrida *et al.* (2020) stated accounting information is one of the most important tools, which is used by investors as a basis for estimating investment risks, and then will make decisions related to those investments. When making investment decisions on the capital market, investors need to evaluate the inherent value of shares, which will be used as the basis to make investment choices (Sutopo *et al.*, 2018).

The share price of a company is a critical indicator of its overall value, reflecting various aspects of its financial health, market position, and future potential. For investors, understanding the valuation of stock prices is paramount before making any investment decisions, as stocks represent a potentially lucrative form of investment. Stock prices are inherently dynamic, constantly fluctuating based on a myriad of factors including market conditions, economic indicators, and company-specific news. When a company's financial performance is strong, characterized by robust revenue growth, profit margins, and effective management, it tends to attract more interest from investors. This increased demand for shares typically leads to a rise in the share price. Conversely, if a company's financial performance falters, investor confidence can wane, causing the share price to drop. Thus, the relationship between a company's financial performance and its share price is both direct and significant, underscoring the importance for investors to carefully analyze financial statements, market trends, and other relevant data to make informed investment choices (Zain *et al.*, 2023). Liquidity and profitability each play a significant role in influencing stock returns. Liquidity, which refers to the ease with which an asset can be converted into cash without affecting its market price, is crucial for investors. Higher liquidity generally means that investors can buy or sell shares quickly and with minimal price fluctuation, making the stock more attractive and potentially enhancing returns. On the other hand, profitability, which measures a company's ability to generate earnings compared to its expenses and other costs, directly impacts investor perception and confidence. Companies with strong profitability are often viewed as stable and capable of delivering consistent returns, which can drive up stock prices and yield higher returns for investors. Both liquidity and profitability, therefore, partially contribute to the overall performance of stock returns, highlighting their importance in investment decision-making (Megawati, 2023).

Zain *et al.* (2023) examined whether there is an influence between return on assets, debt to equity ratio, return on equity, and earning per share on the stock prices. Based on the analysis, the results showed that return on assets, return on equity, and earnings per share have a positive effect on the stock prices. Meanwhile, the debt-to-equity ratio does not show a significant effect on the stock prices. Lukiawati *et al.* (2023) assessed the effect of determinant factors of stock price and also examined whether there were differences in Stock Prices before and during the Covid-19 Pandemic era. The results of the study showed that the earning per share has a significant positive effect on stock prices; while current ratio, inflation, and Rupiah Exchange Rates have no significant effect on share prices. Similarly, there are differences in stock prices before and during the Covid-19 Pandemic. Moreover, Putri *et al.* (2023) analyzed the determinant factors of the stock price performance, proxied by price earnings ratio, in the basic industry and the causal relationship between them. The results revealed that return on equity, debt-equity ratio, price-to-book value, earnings growth, and dividend payout significantly impact the price-earnings ratio and thus become significant determinants of the price-earnings ratio. On the other hand, market return and firm size showed no significant influence on the price-earnings ratio. Medyawati and Yunanto (2023) analyzed the effect of the variables return on assets, return on equity, prices earnings ratio, and earning per share on stock prices of banking sub-

sector companies listed in the Indonesia Stock Exchange (IDX). The results showed that the return on equity has a negative effect on stock prices, while return on assets and earnings per share have a positive effect on stock prices.

Rubaiyath and Lalon (2023) investigated the impact of bank-specific determinants on the stock price of Dhaka Stock Exchange (DSE) listed commercial banks in Bangladesh. Several bank-specific factors such as book to market ratio, return on equity, price/earnings to growth ratio, cash flow per share, debt to equity ratio, earnings per share, dividend per share, bank size and institutional ownership percentage have been analyzed for this study and tried to see the impact of each variable on the change in market price of share of 10 listed commercial banks spanning from 2011 to 2020. The study revealed that only bank size and book to market value explanatory variables are found significantly responsible for fluctuation in the change in share price of banks. Megawati (2023) determined the effect of liquidity and profitability on manufacturing companies listed on the IDX for the 2017-2022 period. The study revealed that liquidity partially has a significant effect on stock returns and profitability partially has a significant effect on stock returns. Siawan and Lukman (2023) analyzed the effect of dividend policy, leverage, growth in assets, and auditor quality on stock price volatility in the plantation industry listed on the Indonesia Stock Exchange for the period 2016 to 2020. The results of this study showed that dividend and leverage policies affect stock volatility, while asset growth and auditor quality have no effect on stock volatility. Companies with high growth rates will expand by using external funds in the form of debt. An increase in assets followed by an increase in operations will increase investor confidence to invest. An investor who focuses on long-term investment will certainly pay attention to the growth of assets in the company from year to year. Anwaar (2016) examined relationship between return on equity, net profit margin, return on assets, and earnings per share with market stock return using all firms listed on London market from 2005 to 2014. The study showed that there is a positive relationship of net profit margin and return on assets with market stock return. On the other hand, the results showed that a negative relationship of earnings per share with stock returns.

In the context of Nepal, Shrestha et al. (2023) assessed the effect of determinants on stock market prices in Nepalese commercial banks. The study is based on a causal-comparative research design. The study showed that earnings per share and dividend per share have a negative and statistically insignificant effect on the market price per share. It means earnings per share and dividend per share don't affect the stock market. The price earnings ratio has a positive and statistically insignificant effect on market price per share. Price earnings ratio also doesn't affect market price per share. Book value per share and market to book value ratio have a positive and statistically significant effect on market price per share. This indicates that an increase in Book value per share and market to book value ratio will invariably bring about a significant increase in the market price per share. Silwal and Napit (2019) showed that book value per share, price earnings ratio, return on equity have positive relationship with stock price. Dividend yield has positive but minimum influence on the price of the stock whereas size has negative relationship and is statistically insignificant with stock price. Further, the study revealed that book value per share is a most influential factor that determines stock price in Nepal. Sapkota (2016) examined the determinants of share price of Nepalese commercial banks. The study concluded that earnings per share, dividend per share, price earnings ratio, return on assets and gross domestic product have significant positive impact on market price per share.

The above discussion shows that empirical evidences vary greatly across the studies on the role of accounting information to investors on stock market. 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 role of accounting information to investors in the stock market. Specifically, it examines the relationship of earnings per share, dividend per share, return on equity, book value per share, net profit margin and return on asset with stock return and stock price of the companies listed in Nepal Stock Exchange.

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 gathered from 18 companies listed in Nepal Stock Exchange with the study period from 2017/18 to 2022/23, leading to a total of 108 observations. The main sources of data include company's annual report of respective companies and website of Nepal Stock Exchange. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of companies selected for the study along with the study period and number of observations.

Table 1

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

S. N.	Name of the companies	Study period	Observations
1	Nepal Bank Limited	2017/18- 2022/23	6
2	Everest Bank Limited	2017/18- 2022/23	6
3	Machhapuchchhre Bank Limited	2017/18- 2022/23	6
4	Standard Chartered Bank Nepal Limited	2017/18- 2022/23	6
5	Sanima Bank Limited	2017/18- 2022/23	6
6	Garima Bikash Bank Limited	2017/18- 2022/23	6
7	Muktinath Bikash Bank Limited	2017/18- 2022/23	6
8	Shine Resunga Development Bank Limited	2017/18- 2022/23	6
9	Miteri Development Bank Limited	2017/18- 2022/23	6
10	Kamana Sewa Bikash Bank Limited	2017/18- 2022/23	6
11	Unilever Nepal Limited	2017/18- 2022/23	6
12	Nepal Lube Oil	2017/18- 2022/23	6
13	Himalayan Dietarily Limited	2017/18- 2022/23	6
14	Bottlers Nepal (Terai) Limited	2017/18- 2022/23	6
15	Bottlers Nepal Limited (Balaju)	2017/18- 2022/23	6
16	Oriental Hotel Limited	2017/18- 2022/23	6
17	Solti Hotel Limited	2017/18- 2022/23	6
18	Taragaon Regency Hotel Limited	2017/18- 2022/23	6
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 market depends on accounting information

available to investors. The dependent variables selected for the study are stock return and stock price. Similarly, the selected independent variables in this study are earnings per share, dividend per share, return on equity, book value per share, net profit margin and return on asset. Therefore, the models take the following forms:

$$SR = \beta_0 + \beta_1 EPS_{it} + \beta_2 DPS_{it} + \beta_3 ROE_{it} + \beta_4 BVPS_{it} + \beta_5 NPM_{it} + \beta_6 ROA_{it} + e_{it}$$

$$MPS = \beta_0 + \beta_1 EPS_{it} + \beta_2 DPS_{it} + \beta_3 ROE_{it} + \beta_4 BVPS_{it} + \beta_5 NPM_{it} + \beta_6 ROA_{it} + e_{it}$$

Where,

SR= Stock return as measured by the sum of capital gain and dividend yield, in percentage.

MPS = Stock price as measured by the closing stock price at the end of fiscal year, in Rs.

EPS= Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rs.

DPS= Dividend per share is measured by the ratio of total amount of dividend paid to equity holders to total outstanding shares, in Rs.

BVPS= Book value per share is measured by the ratio of book value of shareholders equity amount to total outstanding shares, in Rs.

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

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

NPM= Net profit margin as measured by the ratio of net profit of a company to its total revenue, in percentage.

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

Earnings per share (EPS)

Earnings per share is defined as the figure that describe the company's profit per outstanding share of stock. Darami *et al.* (2022) showed that earnings per share, dividend payout ratio, dividend yield, and the size of the banks all have a statistically significant positive relationship with the share price. Edem (2018) concluded that earning per share has a significant positive relationship with stock price. Musallam (2018) revealed that the dividend yield ratio, earnings per share, and earnings yield ratio have a significant linkage with market returns. Similarly, Hertina and Saudi (2019) found that stock returns are significantly and favorably impacted by earnings per share. Emamgholipour *et al.* (2013) found that earnings per share have significant positive effect on stock return. Based on it, this study develops the following hypothesis:

H₁: Earnings per share has a positive relationship with stock return and stock price.

Dividend per share (DPS)

Dividend per share (DPS) is the total dividends paid out over an entire year divided by the number of outstanding ordinary shares issued. Prabath (2014) assessed the impact of accounting variables on stock price of the firms listed in Colombo Stock Exchange, Sri Lanka. The study concluded

that the internal factors, firm-specific factors such as dividend per share (DPS), earnings per share (EPS) and book value per share (BVPS) have positive and significant impact on the stock price. Al-Hasan et al. (2013) evaluated the effect of dividend policy on market price of share in the context of Bangladesh. The study found that there is a significant positive relationship between dividend per share and market price per share. There is a positive and significant relationship between cash dividends, retained earnings, earnings per share, and stock price while stock price is positively (Asem and Tian, 2010). Based on it, this study develops the following hypothesis:

H₂: Dividend per share has a positive relationship with stock return and stock price.

Return on equity (ROE)

Return on equity is a measure of a company's ability to generate profit after tax using its own capital. Abdurachman and Dewi (2023) concluded that return on equity has a positive impact on stock return. Asry (2020) showed that ROE has a significant effect on the stock return. Choiriyah *et al.* (2021) showed that return on assets, return of equity, net profit margin and earnings per share have a significant effect on the stock prices of banking companies on the Indonesia stock exchange (IDX). Karim (2015) showed that the return on equity has a positive and significant effect on stock returns. Zaheri and Barkhordary (2015) showed that the market stock return is significantly affected by return on equity. Based on it, this study develops the following hypothesis:

H₃: Return on equity has a positive relationship with stock return and stock price.

Book value per share (BVPS)

Book value per share is a company's net asset value expressed on a per-share basis. Book value of equity per share effectively indicates a firm's net asset value (total assets - total liabilities) on a per-share basis. Mkmur *et al.* (2023) revealed net assets value per share has a positive significant relationship with market price. Taimur *et al.* (2015) showed a positive and significant association between book value per share and stock price. Bukit (2013) assessed the effect of price to book value (PBV), dividend payout ratio (DPR), return on equity (ROE), return on asset (ROA), and earning per share (EPS) toward issuers included in LQ 45 index. The study found that price to book value, dividend payout ratio and earning price per share have significant positive effect on stock return of LQ 45 Index. Srinivasan (2012) examined the fundamental determinants of share price in India. The study found that book value per share has a positive relationship with share price. Based on it, this study develops the following hypothesis:

H₄: Book value per share has a positive relationship with stock return and stock price.

Net profit margin (NPM)

Net profit margin is a financial metric that measures the profitability of a business. Net profit margin is calculated by dividing the net profit of a company by its total revenue. Digmawati *et al.* (2023) analyzed the stock price through net profit margin, debt to assets ratio, cash ratio, and TATO in health sector companies on the Indonesia Stock Exchange for the 2019-2022. The study showed that the net profit margin has positive and significant impact on share prices. Purdianto *et al.* (2022) assessed the influence of net profit margin and earning per share on stock prices in various industrial sector companies listed on the IDX for the 2015-2019. The study concluded that NPM had a positive and statistically significant effect on stock prices. Anwaar (2016) showed that net profit margin has a significant positive impact on stock returns. Based on it, this study develops the following hypothesis:

H₅: Net profit margin has a positive relationship with stock return and stock price.

Return on asset (ROA)

Return on asset determines how efficient the management is in using its assets to generate revenues. Wahyuningsih *et al.* (2023) concluded that the ROA has a significant effect on stock returns. Rheynaldi *et al.* (2023) showed that the return on assets have a positive impact on stock returns. Likewise, Hayati *et al.* (2020) concluded that return on assets has a significant positive influence on stock prices. Khan *et al.* (2017) found that return on assets has significant positive impact on stock return. Furthermore, Idawati and Wahyudi (2015) concluded that the return on assets has a positive relationship to the stock price and significantly affect stock prices. Based on it, this study develops the following hypothesis.

H₆: Return on asset has a positive relationship with stock return 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 2017/18 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 18 Nepalese companies listed in Nepal Stock Exchange for the study period from 2017/18 to 2022/23. The dependent variables are SR (Stock return as measured by the sum of capital gain and dividend yield, in percentage) and MPS (Stock price as measured by the closing stock price at the end of fiscal year, in Rs.). Similarly, the independent variables are EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rs.), DPS (Dividend per share is measured by the ratio of total amount of dividend paid to equity holders to total outstanding shares, in Rs.), BVPS (Book value per share is measured by the ratio of book value of shareholders equity amount to total outstanding shares, in Rs.), ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage), ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage) and NPM (Net profit margin as measured by the ratio of net profit of a company to its total revenue, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
SR	-74.00	303.00	11.56	55.55
MPS	144.00	32998.00	2326.80	5620.54
EPS	-31.74	2517.00	156.35	389.79
DPS	0.00	1580.00	63.68	218.83
ROE	-14.56	63.95	16.94	13.01
BVPS	17.00	4732.46	570.79	931.31
NPM	-220.36	46.78	21.61	29.85
ROA	-9.50	1264.00	19.49	121.77

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 Pearson's correlation coefficients of dependent and independent variables of 18 Nepalese companies listed in Nepal Stock Exchange for the study period from 2017/18 to 2022/23. The dependent variables are SR (Stock return as measured by the sum of capital gain and dividend yield, in percentage) and MPS (Stock price as measured by the closing stock price at the end of fiscal year, in Rs.). Similarly, the independent variables are EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rs.), DPS (Dividend per share is measured by the ratio of total amount of dividend paid to equity holders to total outstanding shares, in Rs.), BVPS (Book value per share is measured by the ratio of book value of shareholders equity amount to total outstanding shares, in Rs.), ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage), ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage) and NPM (Net profit margin as measured by the ratio of net profit of a company to its total revenue, in percentage).

Variables	SR	MPS	EPS	DPS	ROE	BVPS	NPM	ROA
SR	1							
MPS	0.073	1						
EPS	0.024	0.706**	1					
DPS	0.069	0.843**	0.729**	1				
ROE	0.161*	0.518**	0.467**	0.535**	1			
BVPS	0.019	0.784**	0.669**	0.675**	0.360**	1		
NPM	-0.150	-0.079	-0.010	-0.005	0.264**	-0.155	1	
ROA	-0.058	0.004	-0.006	0.018	0.033	-0.020	0.054	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 positive relationship between earnings per share and stock return. It indicates that increase in earnings per share leads to increase in stock return. Similarly, there is a positive relationship between dividend per share and stock return. It means that higher the dividend per share, higher would be the stock return. Likewise, return on equity has a positive relationship with stock return. It indicates that increase in return on equity leads to increase in stock return. In addition, there is a positive relationship between book value per share and stock return. It indicates that increase in book value per share leads to increase in stock return. However, net profit margin has a negative relationship with stock return implying that higher the net profit margin, lower would be the stock return. Moreover, there is a negative relationship between return on asset and stock return. It indicates that higher the return on assets, lower would be the stock return.

Furthermore, the result shows that there is a positive relationship between earnings per share and stock price. It indicates that higher the earnings per share, higher would be the stock price. In addition, dividend per share has a positive relationship with stock price. It means that higher the dividend per share, higher would be the stock price. Similarly, there is a positive relationship between return on equity and stock price. It reveals that increase in return on equity leads to increase in stock price. Moreover, book value per share has a positive relationship with stock price. It means that higher the book value per share, higher would be the stock price. Furthermore, there is a negative relationship between net profit margin and stock price. It indicates that increase in net profit margin leads to decrease in stock price. Likewise, return on assets has a positive relationship with stock price. It means that higher the return on assets, higher would be the stock price.

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 earnings per share (EPS), dividend per share (DPS), return on equity (ROE), book value per share (BVPS), net profit margin (NPM), return on asset (ROA) with stock return (SR) of Nepalese companies listed in Nepal Stock Exchange.

Table 4

Estimated regression results of earning per share, dividend per share, return on equity), book value per share, net profit margin, return on asset with stock return

The results are based on panel data of 18 Nepalese companies with 108 for the study period from 2017/18 to 2022/23 by using the linear regression model and the model is $SR = \beta_0 + \beta_1 EPS_{it} + \beta_2 DPS_{it} + \beta_3 ROE_{it} + \beta_4 BVPS_{it} + \beta_5 NPM_{it} + \beta_6 ROA_{it} + e_{it}$, where the dependent variable is SR (Stock return as measured by the sum of capital gain and dividend yield, in percentage). Similarly, the independent variables are EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rs.), DPS (Dividend per share is measured by the ratio of total amount of dividend paid to equity holders to total outstanding shares, in Rs.), BVPS (Book value per share is measured by the ratio of book value of shareholders equity amount to total outstanding shares, in Rs.), ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage), ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage) and NPM (Net profit margin as measured by the ratio of net profit of a company to its total revenue, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		EPS	DPS	ROE	BVPS	NPM	ROA			
1	11.010 (1.902)	0.003 (0.252)						0.009	55.790	0.064
2	10.438 (1.870)		0.018 0.714					0.005	55.670	0.509
3	-0.072 (0.008)			0.687 (1.677)				0.017	55.084	2.813
4	10.918 (1.731)				0.001 (0.193)			0.009	55.800	0.037
5	17.592 (0.279)					-0.279 (1.563)		0.013	55.178	2.443
6	12.074 (2.223)*						-0.027 (0.601)	0.006	55.715	0.361
7	11.019 (1.900)	-0.008 (0.389)	0.028 (0.770)					0.013	55.900	0.328
8	-0.293 (0.032)	-0.012 (0.600)	0.009 (0.227)	0.780 (1.583)				0.002	55.504	1.058
9	0.290 (0.030)	-0.011 (0.491)	0.011 (0.280)	0.775 (1.564)	0.002 (0.190)			0.008	55.763	0.795
10	5.737 (0.585)	-0.010 (0.447)	0.009 (0.235)	1.149 (2.245)*	0.006 (0.675)	-0.440 (2.303)*		0.033	54.633	1.723
11	6.130 (0.622)	-0.010 (0.457)	0.010 (0.254)	1.154 (2.247)*	0.006 (0.688)	-0.435 (2.270)*	-0.026 (0.604)	0.027	54.804	1.488

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 earnings per share are positive with stock return. It indicates that there is a positive impact of earnings per share on stock return. The finding is similar with the findings of Musallam (2018). Similarly, the beta coefficients for dividends per share are positive with stock return. It indicates that there is positive impact of dividend per share on stock return. This finding is consistent with the findings of Mkmu *et al.* (2023). Likewise, the beta coefficients for return on equity are positive with stock return. It indicates that there is positive impact of return on equity on

stock return. This finding is similar to the findings of Abdurachman and Dewi (2023). Similarly, the beta coefficients for book value per share are positive with stock return. It indicates that there is positive impact of book value per share on stock return. This finding is consistent with the findings of Bukit (2013). Likewise, the beta coefficients for net profit margin are negative with stock return. It indicates that there is a negative impact of net profit margin on stock return. This finding is similar to the findings of Choiriyah et al. (2021). The result also reveals that the beta coefficients for return on assets are negative with stock return. It indicates that return on assets has negative impact on stock return. This finding is consistent with the findings of Rheyndaldi et al. (2023).

Table 5 shows the regression results of earning per share (EPS), dividend per share (DPS), return on equity (ROE), book value per share (BVPS), net profit margin (NPM), return on asset (ROA) with stock price (MPS) of Nepalese companies listed in Nepal Stock Exchange.

Table 5

Estimated regression results of earning per share, dividend per share, return on equity), book value per share, net profit margin, return on asset with stock price

The results are based on panel data of 18 Nepalese companies with 108 for the study period from 2017/18 to 2022/23 by using the linear regression model and the model is $MPS = \beta_0 + \beta_1 EPS_{it} + \beta_2 DPS_{it} + \beta_3 ROE_{it} + \beta_4 BVPS_{it} + \beta_5 NPM_{it} + \beta_6 ROA_{it} + e_{it}$, where the dependent variable is MPS (Stock price as measured by the closing stock price at the end of fiscal year, in Rs.). Similarly, the independent variables are EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rs.), DPS (Dividend per share is measured by the ratio of total amount of dividend paid to equity holders to total outstanding shares, in Rs.), BVPS (Book value per share is measured by the ratio of book value of shareholders equity amount to total outstanding shares, in Rs.), ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage), ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage) and NPM (Net profit margin as measured by the ratio of net profit of a company to its total revenue, in percentage).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		EPS	DPS	ROE	BVPS	NPM	ROA			
1	735.823 (1.773)	10.176 (10.255)**						0.493	4000.872	105.169
2	948.364 (3.112) **		21.647 (16.122)**					0.708	3039.273	259.933
3	-1466.982 (1.918)			224.014 (6.242)**				0.262	4828.747	38.968
4	-372.174 (0.939)				4.729 (12.982)**			0.610	3508.987	168.522
5	2647.584 (3.953) **					-4.843 (0.814)		0.003	5629.421	0.663
6	2323.625 (4.222) **						0.163 (0.036)	0.009	5646.959	0.001
7	741.261 (2.415) *	2.811 (2.623)**	17.997 (9.427)**					0.723	2958.318	140.617
8	269.949 (0.553)	2.632 (2.440)**	17.196 (8.554)**	32.491 (1.241)				0.724	2950.746	94.740
9	-573.872 (1.292)	0.511 (0.512)	13.093 (7.018)**	39.465 (1.742)	2.310 (6.026) **			0.794	2549.514	104.257
10	-463.774 (1.013)	0.534 (0.536)	13.052 (6.994)**	47.027 (1.969)*	2.228 (5.681) **	-8.895 (0.998)		0.794	2549.575	83.600
11	-464.566 (1.008)	0.535 (0.534)	13.051 (6.955)**	47.017 (1.958)	2.228 (5.652) **	-8.904 (0.993)	0.053 (0.026)	0.792	2562.157	68.985

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 price is the dependent variable.

Table 5 shows that the beta coefficients for earnings per share are positive with stock price. It indicates that earnings per share have a positive impact on stock price. This finding is consistent

with the findings of Darami *et al.* (2022). Likewise, the beta coefficients for dividend per share are positive with stock price. It indicates that dividend per share has a positive impact on stock price. This finding is similar to the findings of Prabath (2014). Furthermore, the beta coefficients for return on equity are positive with stock price. It indicates that return on equity has a positive impact on market price per share. This finding is consistent with the findings of Choiriya *et al.* (2021). Likewise, the beta coefficients for book value per share are positive with stock price. It indicates that book value per share has a positive impact on market price per share. This finding is similar to the findings of Taimur *et al.* (2015). Likewise, the beta coefficients for net profit margin are negative with stock price. It indicates that net profit margin has a negative impact on market price per share. This finding contradicts with the findings of Purdianto *et al.* (2022). Similarly, the beta coefficients for return on assets are positive with stock price. It indicates that return on assets has a positive impact on market price per share. This finding is similar to the findings of Hayati *et al.* (2020).

4. Summary and conclusion

Stock market plays an important role in the economic development of the country. The stock market is one of the most attentive and inquisitive area for investors who always want to create substantial capital in the shortest time phase since stocks are the most wonderful category of financial instruments and one of the greatest tools ever invented for building financial wealth. Fluctuation in share prices occur due to the supply and demand forces. The factors behind the increase or decrease in the demand and supply of share prices can be categorized into three main types: technical factors, fundamental factors and market sentiments. Fundamental factors are those that come from the share issuing company such as earnings, dividends, book value, etc. Similarly, technical factors are those that come from outside the company and are often referred as macro factors such as interest rate, inflation, economic policy, political climate, gross domestic product, trends, etc.

This study attempts to analyze the role of accounting information to investors in the stock market. The study is based on secondary data of 18 companies with 108 observations for the study period from 2017/18 to 2022/23.

The major conclusion of the study is that the earning per share, dividend per share, return on equity and book value per share have positive impact on stock return. It implies that these indicators of financial health and shareholder value are critical drivers of investment performance. However, net profit margin and return on asset have negative impact on stock return. Furthermore, earning per share, dividend per share, return on equity, book value per share and return on asset have positive impact on stock price, reinforcing their importance in shaping market valuations. Likewise, net profit margin has a negative impact on stock price. The study also concluded that dividend per share followed by book value per share and earnings per share is the most influencing factor that explain the stock price in in Nepalese companies in stock market.

References

- Abdurachman, S., and S. Dewi, 2023. Determinants of stock return in consumer non-cyclicals companies listed on IDX. *International Journal of Application on Economics and Business* 1(2), 715-726.
- Al-Hasan, M. A., M. Asaduzzaman, and R. A. Karim, 2013. The effect of dividend policy on share price: An evaluative study. *IOSR Journal of Economics and Finance* 1(4), 6-11.
- Anwaar, M., 2016. Impact of firms' performance on stock returns (Evidence from listed companies of FTSE-100 Index London, UK). *Global Journal of Management and Business Research: Accounting and Auditing* 16(1), 30-39.

- Asem, E. and G. Y. Tian, 2010. Market dynamics and momentum profits. *Journal of Financial and Quantitative Analysis* 45(6), 1549-1562.
- Asry, S., 2020. The effect of accounting information (Net cash flow, return on equity, and company size) on stock returns in manufacturing companies listed on the Indonesia Stock Exchange for the 2018 period. *Journal of Research in Business, Economics, and Education* 2(5), 1224-1247.
- Bukit, I. N. H., 2013. The effect of price to book value, dividend payout ratio, return on equity, return on asset, and earning per share toward stock return of LQ 45 for the period of 2006-2011. *Review of Integrative Business and Economics Research* 2(2), 22-43.
- Choiriyah, C., F. Fatimah, S. Agustina, and F. A. Ulfa, 2021. 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* 2(1), 103-123.
- Darami, A. I., A. S. B. Shahidan, and N. Romli, 2022. The determinants of share price on commercial bank in Bursa Malaysia. *International Journal of Academic Research in Business and Social Sciences* 12(9), 593-605.
- Digmawati, A., F. S. Pohan, and Z. Kisman, 2023. Stock price analysis through net profit margin, debt to assets ratio, cash ratio, and TATO in health sector companies on the Indonesia Stock Exchange for the 2019-2022 Period. *Economics and Business Quarterly Reviews* 6(4), 16-28.
- Edem, I. N., 2018. The inter-play between financial ratios and stock market prices of deposit money banks in Nigeria. *International Accounting and Taxation Review* 2(2), 117-130.
- Emamgholipour, M., A. Pouraghajan, N. A. Tabari, M. Haghparsat, and A. A. A. Shirsavar, 2013. The effect of performance evaluation market ratios on the stock return: evidence from the Tehran stock exchange. *International Research Journal of Applied and Basic Sciences* 4(3), 696-703.
- Hai, T. T., N. N. Diem, and H.Q. Binh, (2015), The relationship between accounting information reported in financial statements and stock returns-empirical evidence from Vietnam. *International Journal of Accounting and Financial Reporting*, 5(1), 229-238.
- Hayati, I., D. H. Saragih, and S. S. Siregar, 2020. The effect of current ratio, debt to equity ratio and return on asset on stock prices in Sharia-based manufacturing companies in Indonesia Stock Exchange. *International Seminar of Islamic Studies* 1(1), 276-290.
- 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.
- Idawati, W., and A. Wahyudi, 2015. Effect of earning per shares and return on assets against share price on coal mining company listed in Indonesia stock exchange. *Journal of Resources Development and Management* 7(1), 79-91.
- Karim, A., 2015. Analisis Pengaruh Faktor Internal dan Eksternal terhadap Return Saham Perusahaan Manufaktur yang terdaftar di Bursa Efek Indonesia (BEI) periode 2010-2012. *Media ekonomi dan manajemen* 30(1), 41-55.
- Khan, R. M., F. Gul, and E. Ali, 2017. Factors influencing stock returns in listed firms of Karachi Stock Exchange. *A Research Journal of Commerce, Economics, and Social Science* 11(2), 248-251.
- Lawrence, A., 2013. Individual investors and financial disclosure. *Journal of Accounting and Economics* 56(1), 130-147.
- Lukiawati, W., T. Badina, and A. Fatoni, 2023. Determinant factors stock price on sharia share price at Covid-19 pandemic era. *Management Science Research Journal* 2(3), 64-73.
- Medyawati, H., and M. Yunanto, 2023. Determinants of banking sector stock prices in Indonesia. *Journal of Economics, Finance and Accounting Studies* 5(2), 40-51.
- Megawati, I. A. P., 2023. Analysis of determinants of stock returns based on liquidity and profitability in manufacturing companies listed on the IDX for the period 2017-2022. *INVEST: Jurnal Inovasi Bisnis dan Akuntansi* 4(2), 650-655.
- Mkmu, M., S. Safeena, and S. S. Hassan, 2023. An empirical study of the value relevance of accounting

- information on investor's decisions in financial sector in Sri Lanka. *Annual International Research Conference* 4(1), 230-237.
- Mlonzi, V. F., J. Kruger, and M. G. Nthoesane, 2011. Share price reaction to earnings announcement on the JSE-ALTX: A test for market efficiency. *Southern African Business Review* 15(3), 142-166.
- Musallam, S. R., 2018. Exploring the relationship between financial ratios and market stock returns. *Eurasian Journal of Business and Economics* 11(21), 101-116.
- Prabath, U. S., 2014. The impact of accounting variables on stock price: Evidence from the Colombo stock exchange, Sri Lanka. *International Journal of Business and Management* 9(5), 125-137.
- Purdianto, A., N. D. Parlina, and D. Apriliani, 2022. The influence of net profit margin and earning per share on stock prices in various industrial sector companies listed on the IDX for the 2015-2019 period. *Journal of Management, Accounting, General Finance and International Economic Issues* 2(1), 243-253.
- Putri, N. K., D. M. Amanah, N. Aini, and J. N. Soelistyoningrum, 2023. Determinants of stock price performance in the Indonesian basic industry. *Journal of Enterprise and Development* 5(3), 585-605.
- Rheynaldi, P. K., E. Endri, M. Minanari, P. A. Ferranti, and S. Karyatun, 2023. Energy price and stock return: evidence of energy sector companies in Indonesia. *International Journal of Energy Economics and Policy* 13(5), 31-36.
- Rubaiyath, A., and R. M. Lalon, 2023. Investigating the impact of bank-specific determinants on stock price of listed commercial banks: Evidence from emerging economy. *International Journal of Economics and Financial Issues* 13(4), 134-142.
- Safrida, E., O. Riswanto, and M. Surianti, 2020. Effect of quality of accounting information and asymmetric information on the cost of capital (Case Study on the Indonesia Stock Exchange). *European Journal of Business and Management* 12(3), 10 -18.
- Sapkota, A., 2016. Firm specific and macroeconomic determinant of share prices of Nepalese commercial banks. *Nepalese Journal of Business*, 3(4), 132-147.
- Shrestha, R. K., G. Acharya, and B. P. Dhakal, 2023. The internal financial determinants of stock price: Evidence from Nepalese commercial banks. *TRANS Asian Journal of Marketing and Management Research* 12(1), 1-10.
- Siawan, R. M., and H. Lukman, 2023. The determinants of stock price volatility in plantation industry in Indonesia during 2016-2020. *International Journal of Application on Economics and Business* 1(3), 2987-1972.
- Silwal, P. P., and S. Napit, 2019. Fundamentals of stock price in Nepalese commercial banks. *International Research Journal of Management Science* 4(1), 84-95.
- Srinivasan, P., 2012. Determinants of equity share prices in India: A panel data approach. *The Romanian Economic Journal* 46(6), 205-228.
- Sutopo, B., S. Kot, A. K. Adiati, and L. N. Ardila, 2018. Sustainability reporting and value relevance of financial statements. *Sustainability* 10(3), 678.
- Taimur S., P. Harsh, and P. Rekha, 2015. Analysis of factor affecting share prices: The case of Bahrain stock exchange, *International Journal of Economics and Finance* 7(3), 65-72.
- Wahyuningsih, S., G. Wiyono, A. Maulida, 2023. The effect of inflation, capital structure, and ROA on stock returns in food and beverage companies listed on Indonesia Stock Exchange in 2017-2020. *Invoice: Journal of Accounting Science*, 5(1), 8-16.
- Zaheri, F., and S. Barkhordary, 2015. Relationship between financial characteristics of companies in cement industry and their stock returns in Tehran stock exchange. *Research Journal of Recent Sciences* 4(8), 77-83.
- Zain, J., S. Graciela, and I. T. Lubis, 2023. Determinants of share price in manufacturing companies listed on the IDX in 2020-2022. *Jurnal Ekonomi* 12(2), 1475-1483.

Chapter 14

Impact of Liquidity Management and Non-Performing Loan on the Performance of Nepalese Commercial Banks

Rahul Shakya*

Abstract

This study examines the impact of liquidity management and non-performing loans on the performance of Nepalese commercial banks. Return on assets (ROA) and return on equity (ROE) are the selected dependent variables. The selected independent variables are liquidity ratio, non-performing loan, loan to deposit ratio, capital adequacy ratio, loan loss provision and bank size. The study is based on secondary data of 12 commercial banks with 105 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 liquidity management and non-performance loan on the financial 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 increase in capital adequacy ratio leads to increase in return on assets and return on equity. In contrast, loan to deposit ratio has a negative impact on return on assets and return on equity. It indicates that increase in loan to deposit ratio leads to decrease in return on assets and return on equity. Likewise, 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, 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. In contrast, liquidity ratio has a negative impact on return on assets and return on equity. It indicates that increase in liquidity ratio leads to decrease in return on assets and return on equity. Further, loan loss provision has a negative impact on return on assets and return on equity. It indicates that increase in loan loss provision leads to decrease in return on assets and return on equity.

Keywords: liquidity ratio, non-performing loan, loan to deposit ratio, capital adequacy ratio, loan loss provision, bank size, return on assets, return on equity

1. Introduction

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. 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). The factors that affect firms' performance are either macro or micro factors and they have an important impact on firms' performance. Macro factors are those factors that are out the control of the company, whereas micro factors include the factors that are under the control of the company. The changes that might happened for macro-economic factors will positively or negatively affect the financial performance of a company. Similarly, if any changes occur for the micro factors, will have the same effect either positively or negatively on the firms that belongs to the same industry. There could be number of reasons for this difference in response of the firms to the same macro changes but all of these reasons are related to the micro factors of the firm (Demirhan and

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

Anwar, 2014). Liquidity risk arises from the fundamental role of banks in the maturity transformation of short-term deposits into long-term loans. Liquidity signifies the aptitude of a financial firm to keep up all the time a balance between the financial inflow and overflow over time (Vento and Ganga, 2009). The concept of liquidity has been a source of worry to the management of firms of the uncertainty of the future. Liquidity is a financial term that means the amount of capital that is available for investment. Each bank attempts to attract more customers in order to obtain more profit and be more profitable bank. The firm's liquidity position would be stronger when they keep a large proportion of current assets but also the over all of profitability will be reduced (Shafana, 2015). Liquidity crises are not new phenomena and banks have endured them throughout history. There are multiple types of liquidity but, when discussed in the banking sector, liquidity is commonly described as the possibility that a bank may become unable to settle its obligations (Drehmann and Nikolaou, 2013). In case of commercial banks, first type of liquidity risk arises when depositors of commercial banks seek to withdraw their money. They become insolvent if the assets are not enough to meet the liability withdrawals. Similarly, the second type of liquidity risk arises when money supply cannot meet the demand of unexpected loans due to the lack of the funds (Baral, 2005).

Liyana and Indrayani (2020) investigated the effect of non-performing loan, loan-to-deposit ratio, and net interest margin on 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 profitability 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 profitability. 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. Ramadhanti *et al.* (2019) examined the effect of capital adequacy, liquidity and credit risk to profitability of commercial banks. The study revealed that capital adequacy ratio (CAR) has a significant positive effect on profitability. However, non-performing loan (NPL) has a negative and significant effect on profitability. 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 profitability. The result found that capital adequacy ratio (CAR) and loan-to-deposit ratio (LDR) have a positive and significant influence on the profitability in State Owned Banks. However, only asset size has positive and significant effect on profitability in foreign bank. Similarly, Agustiningrum (2013) analyzed non-performing loans (NPL) and loan-to-deposit ratio (LDR) towards profitability. The study showed that loan-to-deposit ratio has a positive and significant effects on profitability. In contrast, Ahmad *et al.* (2012) revealed that loan-to-deposit ratio has a negative and significant effects on the profitability.

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 loan 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. 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 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. Brastama and Yadnya (2020) analyzed the effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable. The results found that capital adequacy ratio has a positive effect on return on assets. Similarly, the non-performing loan 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 financial performance. The results revealed that capital adequacy ratio, non-performing loan, and loan-to-deposit ratio has a positive and significant effect on return on assets. Similarly, Solihati (2020) analyzed the factors affecting banking profitability. The results revealed that non-performing loan and capital adequacy ratio have significant effect on ROA. Meanwhile, non-performing loan has a significant negative effect 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 effects on return on assets (ROA).

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 negative insignificant impact with bank performance measured by return on assets (ROA). Moreover, Adhikari *et al.* (2020) assessed the impact of bank capital, liquidity, and credit risk on the profitability of Nepalese commercial banks. The study stated that liquidity ratio and non-performing loan 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 profitability of Nepalese commercial banks. Budhathoki *et al.* (2020) examined the impact of liquidity, leverage, and total size on banks' profitability. 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 profitability 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 profitability 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 profitability of banks in Nepal. Moreover, Khati (2020) examined the impact of liquidity on profitability of Nepalese commercial banks. The study found that credit to deposit ratio has a positive significant relationship with bank profitability.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of liquidity management and non-performing loan on the 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 impact of liquidity management and non-performing loan on the performance of Nepalese commercial banks. Specifically, it examines the relationship of liquidity ratio, non-performing loan, loan to deposit ratio, capital adequacy ratio, loan loss provision and bank size 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 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	Observations
1	Citizens International 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	Machhapuchchhre 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	Nepal SBI Bank Limited	2014/15-2022/23	9
8	Prime Commercial Bank Limited	2014/15-2022/23	9
9	Rastriya Banijya Bank Limited	2014/15-2022/23	9
10	Sanima Bank Limited	2014/15-2022/23	9
11	Siddhartha Bank Limited	2014/15-2022/23	9
12	Standard Chartered 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 capital adequacy ratio, net interest margin, and debt-equity ratio. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are non-performing loans, capital adequacy ratio, net interest margin, loan-to-deposit ratio, debt to equity ratio, and bank size. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 NPL + \beta_4 BS + \beta_5 LIQ + \beta_6 LLP + e_{it}$$

$$ROE = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 NPL + \beta_4 BS + \beta_5 LIQ + \beta_6 LLP + e_{it}$$

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.

LDR = Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

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

BS = Bank size as measured by total assets, NRs. in billion.

LIQ = Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage.

LLP = Loan loss provision as measured by the total amount provisioned in a year, NRs. in million

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

Liquidity

Liquidity is the ability of a firm to meet their current liabilities as they fall due. Excessive amounts of current assets owned by a firm would perhaps increase the chances of internal funding resulting in a relation between leverage and liquidity (Bhunja and Das, 2012). Eljelly (2004) stated that liquidity involves planning and controlling current assets and current liabilities in a manner that eliminates the risk of inability to meet short-term obligations on one hand and avoid excessive investment in these assets on the other hand. Furthermore, sufficient liquidity has an impact on the financial strength of a firm (Bei and Wijewardana, 2012). Agyei and Yeboa (2011) stated that in the banking sector, liquidity is a measure of performance, at least for two reasons; to meet regulatory requirement and to guarantee enough liquidity to meet customers' unannounced withdrawals. Liquidity in this study will be measured using current ratio. Liquidity position of a bank can be measured by calculating ratio of customer deposit to total asset and total loan to customer deposits. However, other scholars use different financial ratio to measure liquidity (Kumbirai and Webb, 2010). Likewise, Lukorito *et al.* (2014) concluded that adequate level of liquidity is positively related with bank's profitability. Based on it, the study develops following hypothesis:

H₁: There is a positive relationship between liquidity and banks' performance.

Non-performing loan

Non-performing loan ratio reflects the bank's credit quality and is considered as an indicator of credit risk management. Anggriani and Muniarty (2020) stressed that banks should lower the level of non-performing loan to increase return on assets suggesting a negative relationship between non-performing loan and financial performance. Çollaku and Aliu (2021) showed a significant negative relationship between non-performing loan and profitability as measured by return on assets. Likewise, Brastama and Yadnya (2020) concluded that non-performing loan is negatively related to financial performance. Similarly, Dewi and Badjra (2020) revealed that non-performing loan is negatively related to profitability. Ramadhanti *et al.* (2019) determined the effect of capital adequacy, liquidity, and credit risk toward profitability and found that there is a negative relationship between non-performing

loan and bank profitability. Similarly, Nwanna and Oguezie (2017) concluded that non-performing loan is negatively related to profitability of banks. Islam *et al.* (2017) revealed a significant negative relationship between non-performing loan and profitability of banks in Bangladesh as measured by return on equity. Based on it, the study develops following hypothesis:

H₂: There is a negative relationship between non-performing loan and bank's performance.

Loan to deposit ratio

The loan to deposit ratio (LDR) is used to assess a bank's liquidity indicator and is determined by dividing the bank's total loans by its total deposits. Doan and Bui (2021) found that the ratio of total loans to total deposits positively affects profitability. Moreover, Jeslin (2017) investigated the impact of credit risk on the profitability of the bank. The study found a positive impact of loan to deposit ratio on return on equity. Soegeng *et al.* (2018) revealed that loan to deposit ratio has a significant positive impact on return on assets. In addition, Agustiningrum (2013) found that loan to deposit ratio has a positive and significant effect on profitability. Further, Rajindra *et al.* (2021) stated loan to deposit ratio has a significant effect on return on assets. Moreover, Supriyono and Herdhayinta (2019) found there is a positive relationship between loan to deposit ratio and profitability. Based on it, the study develops following hypothesis:

H₃: There is a positive relationship between loans to deposit ratio and banks' performance.

Capital adequacy ratio

Capital adequacy ratio is measured as the summation of primary and supplementary capital divided by risk weighted assets (%). Kumar *et al.* (2020) investigated the relationship between monetary policy and bank profitability in New Zealand. The study revealed that capital adequacy ratio is positively related to return on assets. Similarly, Almunani (2013) showed a positive relationship between capital adequacy ratio and profitability of Jordanian banks. Likewise, Ariwidanta and Wiksuana (2018) determined the relationship between credit and liquidity risk to profitability through the capital adequacy ratio as a mediating variable. The study concluded that capital adequacy ratio is positively related to return on assets. Further, Widyastuti *et al.* (2017) found that capital adequacy ratio positively influences profitability. In addition, Alzoubi (2018) concluded a positive relationship between capital adequacy ratio and profitability of banks measured by return on assets. Based on it, the study develops following hypothesis:

H₄: There is a positive relationship between capital adequacy ratio and banks' performance.

Loan loss provision

Loan loss provision is an indication of a bank's capacity to handle future losses on loan. Loan loss provision offers less profitability and instability of the bank. Alhadab and Alsahawneh (2016) revealed that loan loss provision has a negative impact on the profitability of Jordanian commercial banks. Likewise, Iloska (2014) indicated that operating expenses and loan-loss provisions exhibit a negative relationship with bank profitability. Moreover, Pelealu and Worang (2017) found that loan loss provision has a negative and insignificant effect on bank profitability. Loan loss provisions are used as a cushion to adapt to the expected loss resulted from the missed payment of installment on bank's loan portfolio; it is interchangeably known as provision for bad debts (Ozili and Outa, 2017). Based on it, the study develops following hypothesis:

H₅: There is a negative relationship between loan loss provisions and banks' performance.

Bank size

Bank size is measured as the natural logarithm of total assets of the bank (Riaz and Mehar, 2013). Moreover, total asset is used as a proxy of bank size which is believed to affect the efficiency and profitability of the bank. Similarly, Domanovic *et al.* (2018) showed a positive relationship between bank size and Serbian bank profitability. Lohano and Kashif (2019) concluded that bank size is positively related to return on assets and return on equity. San and Heng (2013) revealed a positive relationship between bank size and profitability as measured by return on equity. 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. 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 on return on assets and return on equity. Based on it, the study develops following hypothesis:

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

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 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 tier 1 plus tier 2 capital to total risk weighted assets, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), BS (Bank size as measured by total assets, NRs. in billions), LIQ (Liquidity as measured by the ratio of liquid assets to total assets, in percentage), and LLP (Loan loss provision as measured by the total amount provisioned in a year, Rs. in million).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.22	1.56	0.48
ROE	3.78	69.56	15.15	6.95
CAR	7.49	22.99	13.61	2.20
LDR	0.09	7.98	1.10	1.23
NPL	0.01	4.93	1.42	1.27
BS	40.30	1513.78	221.40	258.82
LIQ	51.38	98.09	81.88	11.30
LLP	2.79	40.51	12.27	7.87

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 tier 1 plus tier 2 capital to total risk weighted assets, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), BS (Bank size as measured by total assets, NRs. in billions), LIQ (Liquidity as measured by the ratio of liquid assets to total assets, in percentage), and LLP (Loan loss provision as measured by the total amount provisioned in a year, Rs. in million).

Variables	ROA	ROE	CAR	LDR	NPL	BS	LIQ	LLP
ROA	1							
ROE	0.601**	1						
CAR	0.201*	0.246*	1					
LDR	-0.032	-0.05	0.007	1				
NPL	-0.179	-0.029	-0.345**	-0.209*	1			
BS	0.143	0.019	0.561**	-0.105	-0.1	1		
LIQ	-0.248**	-0.277**	-0.099	0.267**	-0.172	-0.231*	1	
LLP	-0.500**	-0.354**	-0.014	0.095	0.367**	0.178	0.241*	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. Similarly, loan to deposit ratio has a negative relationship with return on assets. It indicates that increase in loan to deposit ratio leads to decrease in return on assets. Likewise, 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. Further, bank size has a positive relationship with return on assets. It indicates that higher the bank size, higher would be the return on assets. In addition, there is a negative relationship between liquidity ratio and return on assets. It indicates that increase in liquidity ratio leads to decrease in return on assets. Moreover, loan loss provision has a negative relationship with return on assets. It indicates that increase in bank size leads to decrease 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. Similarly, loan to deposit ratio has a negative relationship with return on equity. It indicates that decrease in loan to deposit ratio leads to increase in return on equity. Likewise, 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. Further, bank size has a positive relationship with return on equity. It indicates that higher the bank size, higher would be the return on equity. In contrast, there is a negative relationship between liquidity ratio and return on equity. It indicates that increase in liquidity ratio leads to decrease in return on equity. Moreover, loan loss provision has a negative

relationship with return on equity. It indicates that increase in loan loss provision 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 liquidity ratio, non-performing loan, loan-to-deposit ratio, capital adequacy ratio, loan loss provision, and bank size on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of liquidity ratio, non-performing loan, loan to deposit ratio, capital adequacy ratio, loan loss provision and bank size 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 linear regression model. The model is $ROA = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 NPL + \beta_4 BS + \beta_5 LIQ + \beta_6 LLP + e_u$ 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 tier 1 plus tier 2 capital to total risk weighted assets, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), BS (Bank size as measured by total assets, NRs. in billions), LIQ (Liquidity as measured by the ratio of liquid assets to total assets, in percentage), and LLP (Loan loss provision as measured by the total amount provisioned in a year, Rs. in million).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		CAR	LDR	NPL	BS	LIQ	LLP			
1	0.958 (3.320)**	0.044 (2.114)*						0.031	0.477	4.470
2	1.574 (24.938)**		-0.012 (0.326)					0.008	0.487	0.106
3	1.657 (23.945)**			-0.068 (1.876)				0.023	0.479	3.521
4	1.501 (24.541)**				0.026 (1.489)			0.011	0.482	2.218
5	2.430 (7.282)**					-0.011 (2.632)**		0.052	0.472	6.926
6	1.938 (25.693)**						-0.031 (5.946)**	0.048	0.526	5.298
7	0.972 (3.323)**	0.044 (2.108)*	-0.013 (0.347)					0.023	0.479	2.277
8	1.203 (3.553)**	0.034 (1.510)	-0.024 (0.635)	-0.053 (1.340)				0.031	0.477	2.127
9	1.277 (3.405)**	0.027 (0.984)	-0.022 (0.578)	-0.055 (1.373)	0.019 (0.468)			0.023	0.479	1.638
10	2.280 (4.379)**	0.024 (0.910)	-0.841 (0.349)	-0.071 (1.822)	0.223 (0.010)	-0.012 (2.696)**		0.079	0.465	2.844
11	1.713 (3.641)**	0.026 (1.105)	-0.029 (0.850)	-0.032 (0.823)	0.216 (1.656)	-0.003 (0.708)	-0.034 (5.486)**	0.284	0.410	8.062

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 Widyastuti *et al.* (2017). However, 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 consistent with the findings of Hadian and Phety (2021). Likewise,

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 Kodithuwakku (2015). Moreover, 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 Lohano and Kashif (2019). However, the beta coefficients for liquidity are negative with return on assets. It indicates that liquidity has a negative impact on return on assets. This finding is not similar to the findings of Ibe (2013). Moreover, the beta coefficients for loan loss provision are negative with return on assets. It indicates that bank size has a negative impact on return on assets. This finding is not similar to the findings of Alhadab and Alsahawneh (2016).

Table 5 shows the regression results of liquidity ratio, non-performing loan, loan-to-deposit ratio, capital adequacy ratio, loan loss provision, and bank size on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of liquidity ratio, non-performing loan, loan-to-deposit ratio, capital adequacy ratio, loan loss provision and bank size with return on equity

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 $ROE = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 NPL + \beta_4 BS + \beta_5 LIQ + \beta_6 LLP + e_{it}$ 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 CAR (Capital adequacy ratio as measured by the ratio of tier 1 plus tier 2 capital to total risk weighted assets, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), BS (Bank size as measured by total assets, NRs. in billions), LIQ (Liquidity as measured by the ratio of liquid assets to total assets, in percentage), and LLP (Loan loss provision as measured by the total amount provisioned in a year, Rs. in million).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	LDR	NPL	BS	LIQ	LLP			
1	25.718 (6.281)**	0.777 (2.615)**						0.052	6.770	6.839
2	14.834 (16.398)**		-0.283 (0.515)					0.007	6.977	0.266
3	15.372 (15.242)**			-0.159 (0.300)				0.009	6.983	0.090
4	15.260 (17.221)**				0.001 (0.198)			0.009	6.984	0.039
5	29.085 (6.125)**					-0.170 (2.963)**		0.068	6.713	8.778
6	18.991 (16.253)**						-0.313 (3.903)**	0.117	6.532	15.236
7	25.410 (6.128)**	0.778 (2.610)**	-0.293 (0.549)					0.045	6.793	3.547
8	28.345 (5.895)**	0.911 (2.870)**	-0.149 (0.272)	-0.673 (1.198)				0.049	6.779	2.853
9	32.235 (6.132)**	1.283 (3.376)**	-0.253 (0.464)	-0.765 (1.369)	0.005 (1.747)			0.068	6.713	2.945
10	51.219 (7.237)**	1.334 (3.728)**	-0.678 (1.291)	-1.081 (2.028)*	0.003 (1.180)	-0.218 (3.754)**		0.173	6.323	5.475
11	45.961 (6.673)**	1.318 (3.879)**	-0.950 (1.882)	-0.116 (0.202)	0.007 (2.229)*	-0.138 (2.308)*	-0.316 (3.481)**	0.254	6.004	7.079

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 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 not similar to the findings of Islam *et al.* (2017). However, the beta coefficients for loan to deposit ratio are negative with return on equity. It indicates that net loan to deposit ratio has a negative impact on return on equity. This finding is not consistent with the findings of Jeslin (2017). Likewise, 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 *et al.* (2017). Further, 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 consistent with the findings of Alfadli and Rjoub (2020). In contrast, the beta coefficients for liquidity are negative with return on equity. It indicates that liquidity has a negative impact on return on equity. This finding is not similar to the findings of (Ali (2020). Moreover, 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 not similar to the findings of Pelealu and Worang (2017).

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 liquidity management and non-performing loan on the 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 capital adequacy ratio, and bank size have positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio, and bank size, higher would be the return on assets and return on equity. In contrast, loan to deposit ratio, non-performing loan, liquidity, and loan loss provision have negative impact on return on assets and return on equity. It indicates that higher the loan to deposit ratio, non-performing loan, liquidity, and loan loss provision, higher would be the return on assets and return on equity. Likewise, the study also concluded that capital adequacy ratio followed by bank size is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese commercial banks.

References

- Adhikari, K., K. Mainanli, and M. Kargbo, 2020. Impact of bank capital, liquidity, and credit risk profitability on Nepalese commercial banks. *Nepalese Journal of Finance* 7(3), 143-156.
- Agustiningrum, R., 2013. Analysis of the Effect of CAR, NPL, and LDR on Profitability in Banking Companies. *E-Journal of Management Study Program, Faculty of Economics and Business, Udayana University* 2(8), 885-902.
- Agyei, S. K., and B. Yeboah, 2011. Working capital management and profitability of banks in Ghana, British. *Journal of Economics, Finance and Management Sciences* 2(2), 23-28.

- 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 profitability 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. Thalassinios, and Y. Thalassinios, 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.
- 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.
- Alzoubi, T., 2018. Determinants of bank profitability: Islamic versus conventional banks. *Banks and Bank Systems* 13(3), 106-113.
- Amenawo, I., H. B. Riman, and E. S. Akpan, 2016. Foreign exchange fluctuations and commercial banks profitability in Nigeria. *Foreign Exchange* 7(18), 1-7.
- 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.
- 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.
- Baral, K., 2005. Health check-up of commercial banks in the framework of CAMEL: A case study of joint venture banks in Nepal. *Health Check-up of the Journal of Nepalese Business Studies* 2(1), 41-55.
- Bei, Z., and W.P. Wijewardana, 2012. Financial leverage, firm growth and financial strength in listed companies in Sri Lanka. *Procedia- Social and Behavioral Sciences* 40(2012), 709-715
- Bhunia, A., and A. Das, 2012. Affiliation between working capital management and profitability. *Interdisciplinary Journal of Contemporary Research in Business* 3(9), 957-968.
- 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* 4(12), 43-49.
- 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* 4(12), 43-49.
- Budhathoki, P. B., K. C. Rai, P. Lamichhane, K. G. Bhattarai, and A. Rai, 2020. The impact of liquidity, leverage, and total size on banks' profitability: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 123-135.

- 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.
- Çollaku, B., and M. Aliu, 2021. Impact of non-performing loans on bank's profitability: empirical evidence from commercial banks in Kosovo. *Journal of Accounting, Finance and Auditing Studies* 7(3), 226-242.
- Demirhan, H. G. and W. Anwar, 2014. Factors affecting the financial performance of the firms during the financial crisis: Evidence from Turkey. *Ege Strategic Research Journal* 5(1), 65-80.
- Dewi, N. K. C., and I. B. Badjra, 2020. The effect of NPL, LDR and operational cost of operational income on ROA. *American Journal of Humanities and Social Sciences Research* 4(7), 171-178.
- Doan, T., and T. Bui, 2021. How does liquidity influence bank profitability? A panel data approach. *Accounting* 7(1), 59-64.
- 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 Review* 1(1), 51-62.
- Domanović, V., V. Todorović, and S. Savović, 2018. Internal factors of bank profitability in the republic of Serbia. *Business and Economic Horizons* 14(3), 659-673.
- Drehmann, M. and K. Nikolaou, 2013. Funding liquidity risk: definition and measurement. *Journal of Banking and Finance* 37(7), 2173-2182.
- Eljeljy, A. M., 2004. Liquidity-profitability tradeoff: An empirical investigation in an emerging market. *International Journal of Commerce and Management* 14(2), 48-61.
- 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.
- 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 (TURCOMAT)* 12(8), 791-798.
- 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.
- Iloska, N., 2014. An analysis of bank profitability in Macedonia. *Journal of Applied Economics and Business* 2(1), 31-50.
- Islam, M. A., M. N. I. Sarker, M. Rahman, A. Sultana, and A. S. Prodhan, 2017. Determinants of profitability of commercial banks in Bangladesh. *International Journal of Banking and Financial Law* 1(1), 1-11.
- 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.
- Khati, P., 2020. Impact of liquidity on profitability of Nepalese commercial banks. *IOSR Journal of Economics and Finance (IOSR-JEF)* 11(6), 26-33.
- Kishori, B., and S. J. Jeslin, 2017. A study of the impact of credit risk on the Profitability of Indian Banks. *International Journal of Science Research and Technology* 3(1), 37-45.
- 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), 35-52.
- Kumbirai, M., and R. Webb, 2010. A Financial ratio analysis of commercial bank performance in South Africa. *African Review of Economics and Finance* 2(1), 30-53.

- Lawati, L., 2021. The effect of loan-to-deposit ratio and debt to equity ratio on return on equity. *Journal Manajemen dan Bisnis* 5(1), 101-107.
- Liyana, L., and E. Indrayani, 2020. The effect of non-performing loan (NPL), loan-to-deposit ratio (LDR) and net interest margin (NIM) on 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.
- Lohano, K., and M. Kashif, 2019. Factors affecting the profitability of banks in developing countries. *International Journal of Business and Management* 14(2), 1-18.
- Lukorito, S., W. Muturi, A. Nyangau, and D. Nyamasenge, 2014. Assessing the effect of liquidity on profitability of commercial banks in Kenya. *Journal of Finance and Accounting* 5(19), 145-152.
- Neupane, B. P., 2020. Profitability determinants of Nepalese commercial banks. *Press Academia Procedia (PAP)* 12(5), 40-45.
- Nwanna, I. O., and F. C. Oguezie, 2017. Effect of credit management on profitability of deposit money banks in Nigeria. *International Journal of Banking and Finance Research* 3(2), 137-160.
- Ogunbiyi, S. S., 2014. Interest rates and deposit money banks profitability nexus: The Nigerian experience. *Arabian Journal of Business and Management Review* 3(11), 133-149.
- 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. *Journal EMBA: Journal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi* 6(4), 3278-3287.
- 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 profitability of commercial banks. *Journal of Economics, Business, and Government Challenges* 2(1), 71-78.
- Ramadhanti, C., M. Marlina, and S. Hidayati, 2019. The effect capital adequacy, liquidity and credit risk to profitability of commercial banks. *Journal of Economics, Business, and Government Challenges*, 2(1), 71-78.
- 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.
- 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.
- 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.
- 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.
- Shafana, M., 2015. Liquidity and Profitability of Financial Institution in Sri Lanka. *International Journal of Science and Research* 4(6), 589-593.

- Soegeng, F. X., L. Lusy, V. R. Inggawati, and H. W. Oetomo, 2018. Effect of Loan to Deposit Ratio (LDR), Non-Performing Loan (NPL), Net Interet Margin (NIM) On Return on Assets (ROA) with ATM as Moderation Variables. *Saudi Journal of Economics and Finance (SJEF)* 2(5), 243-250.
- Solihati, G. P., 2020. Analysis of factors affecting banking profitability. *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. *Ilomata International Journal of Management* 1(4), 149-158.
- Supriyono, R. A., and H. Herdhayinta, 2019. Determinants of Bank Profitability: The case of the regional development bank (BPD Bank) in Indonesia. *Journal of Indonesian Economy and Business* 34(1), 1-17.
- 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 (IJCIET)* 10(9), 313-324.
- Vento, G. A., and P. La Ganga, 2009. Bank liquidity risk management and supervision: which lessons from recent market turmoil. *Journal of Money, Investment and Banking* 10(10), 79-126.
- Widyastuti, U., E. D. Purwana, and S. Zulaihati, 2017. Internal determinants of commercial bank profitability in Indonesia. *Mediterranean Journal of Social Sciences* 8(3), 219-219.

Chapter 15

Relationship among Credit Risk, Liquidity Risk and Profitability of Nepalese Commercial Banks

Manisha Kshatry*

Abstract

This study examines the relationship among credit risk, liquidity risk and profitability of Nepalese commercial banks. Return on assets and return on equity are selected as the dependent variables. The selected independent variables are liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing loan, and capital adequacy ratio. The study is based on secondary data of 15 commercial banks with 120 observations for the period from 2015/16 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank 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 risk and profitability of Nepalese commercial banks.

The results 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 on return on assets and return on equity. Similarly, liquidity ratio has a positive impact on return on assets and return on equity. It indicates that higher the liquidity ratio, higher would be the return on assets and return on equity. In contrast, cash reserved ratio has a negative impact on return on assets and return on equity. It indicates that higher the cash reserved ratio, lower would be the return on assets and return on equity. Likewise, credit to deposit ratio has a negative impact on return on assets and return on equity. It indicates that higher the credit to deposit ratio, lower would be the return on assets and return on equity. Further, cost efficiency ratio has a negative impact on return on assets and return on equity. It indicates that increase in cost efficiency ratio leads to decrease in return on assets and return on equity. In addition, loan loss provision has a negative impact on return on assets and return on equity. It indicates that higher the loan loss provisions, 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 higher the non-performing loan, lower would be the return on assets and return on equity.

Keywords: return on assets, return on equity, liquidity ratio, cash reserve ratio, credit to deposit ratio, capital adequacy ratio, loan loss provision, cost efficiency ratio, non-performing loan

1. Introduction

The banking sector is the backbone of any country's economy. Maintaining strong performance is crucial for banks since it has a significant impact on public trust (Safitri *et al.*, 2022). Poor bank performance will lead to failure and financial crises, both of which would be harmful to economic growth (Nuhui *et al.*, 2017). Profit is one of the banking industry's main goals. Profitability is the ability of the company to make a profit or a measure of the effectiveness of management. A large profit margin indicates the efficacy of the bank. A high level of profitability can also serve as evidence of the bank's expansion and increase in output. Profitability is therefore essential for the bank and its customers (Suyono *et al.*, 2017). The traditional objective of management is to maximize shareholder value. To safeguard the interests of shareholders, the management of the banks should evaluate cash flows and related unanticipated risks using a variety of conventional financial approaches as well as

* Ms. Kshatry is a Freelance Researcher, Kathmandu, Nepal.

sophisticated risk prediction models. In the financial industry, understanding the interplay between credit risk, liquidity risk, and profitability is essential for maintaining a stable and profitable banking environment. Each of these factors plays a crucial role in determining the financial health of a bank or financial institution. Liquidity risk is the risk that a bank will not be able to meet its short-term financial obligations due to an inability to convert assets into cash quickly without significant loss.

A lack of liquidity might force the bank to reduce lending, which can hinder its ability to generate income and satisfy customer demand for loans. Banking is one of the most vital sectors underpinning financial stability and economic advancement in a country (Ryu *et al.*, 2012). Commercial banks serve as key financial intermediaries, significantly contributing to the economic growth of any nation. The resilience of commercial banks, particularly within a well-developed financial system, reduces the risk of severe disruptions in financial intermediation that could otherwise impede the effective allocation of savings into profitable investments. The banking sector's role is crucial for the financial landscape, where its development is closely linked with overall economic advancement (Lipunga, 2014). The banking system is instrumental in facilitating the transfer of funds from savers to investors, a process fundamental to economic progress (Nshimiyimana and Zubeda, 2017). Adolopo *et al.* (2018) found a weak relationship between return on assets and liquidity and a positive relationship with net interest margin.

Power (2005) observed that operational risk is not taken seriously before the Basel II reforms, but has since been recognized as a significant source of financial sector losses. Non-performing loans (NPLs) have a direct impact on a bank's profitability, as they lead to increased provisions for doubtful debts and write-offs, which can diminish net profit and capital levels (Ombaba, 2013). Further, Vallabh *et al.* (2007) identified that non-performing assets as a key indicator of a bank's financial health. The relationship between a bank's profitability and its capital requirements is complex, as capital is a crucial buffer that supports the bank's business and mitigates risks in adverse conditions (Christian *et al.*, 2008). Loan loss provisions, often referred to as bad debt provisions, serve as a financial buffer for banks, helping them absorb anticipated losses from missed payments on loans within their portfolios (Ozili and Outa, 2017). The policy of loan-loss provisioning plays a critical role in maintaining financial system stability, as it significantly influences fluctuations in bank profitability and capital adequacy, which in turn affects the availability of loans to the economy (Beatty and Liao, 2009).

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.

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 loan 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. Likewise, 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 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.

Brastama and Yadnya (2020) analyzed the effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable. The results found that capital adequacy ratio has a positive effect on return on assets. Similarly, the non-performing loan 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 financial performance. The results revealed that capital adequacy ratio, non-performing loan, and loan-to-deposit ratio has a positive and significant effect on return on assets. Similarly, Solihati (2020) analyzed the factors affecting banking profitability. The results revealed that non-performing loan and capital adequacy ratio have significant effect on return on assets. Meanwhile, non-performing loan has a significant negative effect on return on assets and capital adequacy ratio is not significantly affected by return on assets. 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 and loan-to-deposit ratio have positive and significant effects on return on assets.

In the context of Nepal, Chhetri (2021) assessed the impact of credit risk on the financial performance of commercial banks. The study found that non-performing loans have negative but significant impact on financial performance as measured by return on assets. The study also found that bank size and capital adequacy ratio have a negligible impact on return on assets. Similarly, Singh *et al.* (2021) explored the effect of NPLs on conventional banks in Nepal. The study revealed that return on assets, bank size, gross domestic product, and inflation have significant influence on non-performing loan, while capital adequacy ratio has no impact on non-performing loan. In contrast, the study found a positive and significant relationship between gross domestic product and non-performing loan. Likewise, Khatri (2020) examined the relationship between liquidity and profitability in Nepalese commercial banks. The study showed that asset quality is negatively and significantly correlated with return on assets, but positively associated with return on equity. Additionally, the cash to deposit ratio showed a positive, albeit minor, correlation with both return on assets and return on equity. Further, Budhathoki *et al.* (2020) examined the impact of liquidity, leverage, and total size on banks' profitability. The study revealed that loan-to-deposit ratio has a negative effect on the bank's return on assets and return on equity. In addition, Neupane (2020) found that the profitability 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.

The above discussion shows that empirical evidences vary greatly across the studies on the relationship among credit risk, liquidity risk and 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 relationship among credit risk, liquidity risk and profitability of Nepalese commercial banks. Specifically, it examines the relationship of liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing

loan, and capital adequacy 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 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 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	2015/16-2022/23	8
Private Banks			
10	Citizens International Bank 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

Source: Annual Reports

Thus, the study is based on the 120 observations.

The model

The model used in this study assumes that profitability depends upon credit risk and liquidity risk. The dependent variables selected for the study are return on assets and return on equity. Similarly,

the selected independent variables are liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing loan, and capital adequacy ratio. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CDR_{it} + \beta_3 LLP_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 CRR_{it} + \beta_7 CER_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CDR_{it} + \beta_3 LLP_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 CRR_{it} + \beta_7 CER_{it} + e_{it}$$

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.

LR = Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage.

CDR = Credit-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

LLP = Loan loss provision as measured by the ratio of loan loss provision to total loans, 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 loans to total loans, in percentage.

CRR = Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage.

CER = Cost efficiency 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:

Liquidity ratio

The liquidity ratio, which measures the proportion of total loans to total deposits, has been studied for its impact on bank profitability. Ibrahim (2017) identified a positive link between liquidity and profitability. Similarly, Kohlscheen *et al.* (2018) concluded that liquidity influences return on assets in a similar direction. Conversely, Duraj and Moci (2015) explored the macroeconomic determinants affecting banking profitability and discovered that liquidity does not influence return on equity. Likewise, Singam (2014) reported an effective correlation between return on assets and liquidity ratio. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between liquidity ratio and profitability of banks.

Credit-to-deposit ratio

The credit-to-deposit ratio is a critical measure of a bank's liquidity, reflecting how effectively it utilizes deposited funds for lending purposes. Yigermal (2017) found that a higher credit-to-deposit ratio is associated with decreased profitability among private commercial banks in Ethiopia. Similarly, Golubeva *et al.* (2019) reported a negative associations between return on equity and credit-to-deposit ratio. Likewise, Hutasuht (2019) highlighted a negative impact of the loan-to-deposit ratio on firm value. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between credit to deposit ratio and profitability of banks.

Loan loss provision

Alhadab and Alsahawneh (2016) indicated that loan loss provision has a negative impact on profitability of Jordanian commercial banks. Similarly, Al-Jafari and Alchami (2014) reported a negative impact of loan loss provision on return on equity. In contrast, Pelealu and Worang (2017) observed that loan loss provisions has a negative impact on bank's profitability. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between loan loss provisions and profitability of banks.

Capital adequacy ratio

The capital adequacy ratio, which measures the ratio of total capital to total risk weighted exposure, is crucial for assessing financial stability. Mathuva (2009) found a positive relation between bank's profitability and core capital ratio. Similarly, Setyarini (2020) showed a positive impact of capital adequacy ratio on return on assets. Likewise, Ebenezer *et al.* (2017) observed a positive correlation between capital adequacy and profitability among sixteen Nigerian commercial banks between 2010 and 2015. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between capital adequacy ratio and profitability of banks.

Non-performing loan

Non-performing loan, sometimes referred to as non-performing assets, are a basis of indicator a bank's performance and financial health. Al-Amin *et al.* (2021) found that non-performing loan has a negative impact on bank's profitability. Similarly, Martiningtiyas and Nitinegeri (2020) observed a substantial negative impact of non-performing loan on bank's profitability. Likewise, Darmawan *et al.* (2020) reported a negative impact of non-performing loan on return on assets. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between non-performing loans and profitability of banks.

Cash reserve ratio

Cash reserve ratio is a crucial monetary policy tool employed by central banks to manage the money supply within an economy. Wuave *et al.* (2020) indicated a negative impact of cash reserve ratio on bank's profitability. Similarly, Hoque *et al.* (2020) examined the impact of monetary policy on bank's profitability: A study on listed commercial banks in Bangladesh. The study revealed that there is a negative relationship between cash reserve ratio and bank's profitability. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between cash reserve ratio and profitability of banks.

Cost efficiency ratio

The cost efficiency ratio, a crucial measure for assessing banking operations, compares operational costs to total income. Anggraeni (2022) concluded that operational expenses ratio negatively impacts both profitability and capital. Similarly, Das and Uppal (2021) reported a significant negative impact of operating costs on profitability. Likewise, Antoni and Nasri (2015) found a partially negative impact of operational efficiency on return on assets. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between cost efficiency ratio and profitability of banks.

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 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 LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage), CDR (Credit-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage) LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, 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 loans to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), and CER (Cost efficiency ratio as measured by the ratio of operating expenses to operating income, in percentage).

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
CTD	56.88	96.08	83.06	8.55
LR	2.89	88.62	21.10	17.51
CRR	3.00	6.00	4.50	1.22
LLP	0.07	10.39	2.38	1.98
CER	20.35	71.57	43.09	9.63

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 of 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 LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage), CDR (Credit-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage) LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, 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 loans to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), and CER (Cost efficiency ratio as measured by the ratio of operating expenses to operating income, in percentage).

Variables	ROA	ROE	CAR	NPL	CTD	LR	CRR	LLP	CER
ROA	1								
ROE	0.449**	1							
CAR	0.382**	0.080	1						
NPL	-0.010	-0.253**	-0.056	1					
CTD	-0.172	-0.148	-0.220*	-0.393**	1				
LR	0.171	0.066	0.083	0.346**	-0.235**	1			
CRR	-0.345**	-0.184*	0.023	-0.021	-0.248**	0.027	1		
LLP	-0.243**	-0.232*	-0.047	0.460**	0.030	-0.087	-0.416**	1	
CER	-0.368**	-0.307**	-0.149	0.181*	0.171	-0.119	-0.404**	0.462**	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 higher the capital adequacy ratio, higher would be the return on assets. Conversely, non-performing loan has a negative relationship with return on assets. It indicates that increase in non-performing loans lead to decrease in return on assets. Similarly, credit-to-deposit ratio has a negative relationship with return on assets. It indicates that higher the credit-to-deposit ratio, lower would be the return on assets. However, liquidity ratio has a positive relationship with return on assets. It indicates that higher the liquidity ratio, higher would be the return on assets. In contrast, cash reserve ratio has a negative relationship with return on assets. It indicates that increase in cash reserve ratio leads to decrease in return on assets. Further, loan loss provisions has a negative relationship with return on assets. It indicates that increase in loan loss provisions lead to decrease in return on assets. In addition, cost efficiency ratio has a negative relationship with return on assets. It indicates that an increase in cost efficiency ratio leads to decrease in return on assets.

Similarly, the result also shows that capital adequacy ratio has a positive relationship with return on equity. It indicates that higher the capital adequacy ratio, higher would be the return on equity. Conversely, non-performing loan has a negative relationship with return on equity. It indicates that increase in non-performing loans lead to decrease in return on equity. Similarly, credit-to-deposit ratio has a negative relationship with return on equity. It indicates that higher the credit-to-deposit ratio, lower would be the return on equity. However, liquidity ratio has a positive relationship with return on equity. It indicates that higher the liquidity ratio, higher would be the return on equity. In contrast, cash reserve ratio has a negative relationship with return on equity. It indicates that increase in cash reserve ratio leads to decrease in return on equity. Further, loan loss provisions has a negative relationship with return on equity. It indicates that increase in loan loss provisions lead to decrease in return on equity. In addition, cost efficiency ratio has a negative relationship with return on equity. It indicates that an increase in cost efficiency 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 liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing loan, and capital adequacy ratio with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio,

loan loss provision, non-performing loan, and capital adequacy ratio 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 the linear regression model and the model is $ROA_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CDR_{it} + \beta_3 LLP_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 CRR_{it} + \beta_7 CER_{it} + e_{it}$ 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 LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage), CDR (Credit-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage) LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, 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 loans to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), and CER (Cost efficiency 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
		CAR	NPL	CTD	LR	CRR	LLP	CER			
1	0.412 (1.547)	0.084 (4.495)**							0.139	0.480	20.200
2	1.598 (21.842)**		-0.004 (0.109)						0.008	0.520	0.012
3	2.456 (5.316)**			-0.011 (1.892)					0.021	0.510	3.570
4	1.485 (19.991)**				0.005 (1.881)				0.021	0.510	3.530
5	0.931 (5.426)**					-0.147 (3.991)**			0.111	0.490	15.920
6	1.745 (23.913)**						-0.064 (2.720)**		0.051	0.510	7.400
7	2.454 (11.951)**							-0.020 (4.300)**	0.128	0.480	18.490
8	0.403 (1.463)	0.084 (4.476)**	0.004 (0.134)						0.132	0.480	10.020
9	1.042 (1.611)	0.078 (4.033)**	-0.012 (0.332)	-0.006 (1.092)					0.133	0.480	7.090
10	0.942 (1.461)	0.076 (3.914)**	-0.030 (0.794)	-0.006 (0.951)	0.004 (1.616)				0.145	0.480	6.040
11	0.332 (0.486)	0.080 (4.390)**	-0.010 (0.286)	-0.001 (0.166)	0.004 (1.682)	-0.143 (4.046)**			0.246	0.450	8.750
12	0.286 (0.418)	0.081 (4.441)**	-0.015 (0.354)	-0.002 (0.305)	0.003 (1.282)	-0.126 (3.205)**	-0.030 (1.044)		0.246	0.450	7.480
13	0.197 (0.278)	0.077 (4.259)**	-0.023 (0.552)	-0.003 (0.523)	0.003 (1.087)	-0.104 (2.616)**	-0.014 (0.487)	-0.011 (2.146)*	0.270	0.440	7.270

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 asset 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 Mathuva (2009). Conversely, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loans has a negative impact on return on assets. This finding is consistent with the findings of Al-Amin *et al.* (2021). Similarly, the beta coefficients for credit to deposit ratio are negative with return on assets. It indicates that credit to deposit ratio has a negative impact on return on assets. This finding is consistent with the findings of Yigermal (2017). However, the beta coefficients for liquidity ratio are positive with return on assets. It indicates that liquidity ratio has a positive impact on return on assets. This finding is similar to the findings of Kohlscheen *et al.* (2018). 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 Wuave *et al.* (2020). Further, 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). In addition, the beta coefficients for cost efficiency ratio are negative with return on assets. It indicates that cost efficiency ratio has a negative impact on return on assets. This finding is similar to the findings of Anggraeni (2022).

Table 5 shows the regression results of liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing loan, and capital adequacy ratio with return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of liquidity risk, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, non-performing loan, and capital adequacy ratio 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 the linear regression model and the model is $ROE_{it} = \beta_0 + \beta_1 LR_{it} + \beta_2 CDR_{it} + \beta_3 LLP_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 CRR_{it} + \beta_7 CER_{it} + e_{it}$ 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 LR (Liquidity ratio as measured by the ratio of liquid assets to total assets, in percentage), CDR (Credit-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage) LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, 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 loans to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), and CER (Cost efficiency ratio as measured by the ratio of operating expenses to operating income, in percentage).

Model	Intercept	Regression coefficients of							Adj. R ²	SEE	F-value
		CAR	NPL	CTD	LR	CRR	LLP	CER			
1	16.458 (5.642)**	0.177 (0.868)							0.002	5.323	0.754
2	15.504 (21.572)**		-0.987 (2.846)**						0.056	5.166	8.098
3	21.590 (4.569)**			-0.092 (1.623)					0.014	5.281	2.653
4	13.540 (17.733)**				0.020 (0.715)				0.004	5.328	0.511
5	10.387 (5.692)**					-0.794 (2.030)*			0.026	5.249	4.120
6	15.439 (20.780)**						-0.621 (2.586)**		0.046	5.195	6.687
7	21.255 (9.960)**							-0.169 (3.502)**	0.086	5.082	12.264
8	18.490 (6.344)**	0.209 (1.057)	-1.008 (2.902)**						0.057	5.163	4.612
9	39.674 (6.084)**	0.394 (2.018)*	-1.551 (4.263)**	-0.213 (3.590)**					0.144	4.919	7.684
10	38.582 (5.943)**	0.422 (2.175)*	-1.746 (4.630)**	-0.204 (3.451)**	0.048 (1.765)				0.160	4.875	6.646
11	34.684 (4.747)**	0.410 (2.109)*	-1.686 (4.436)**	-0.184 (2.992)**	0.048 (1.756)	-0.438 (1.156)			0.162	4.868	5.600
12	34.506 (4.695)**	0.414 (2.118)*	-1.785 (3.861)**	-0.187 (3.004)**	0.052 (1.781)	-0.506 (1.203)	0.115 (0.378)		0.156	4.886	4.656
13	39.815 (5.224)**	0.459 (2.374)*	-1.695 (3.711)**	-0.174 (2.820)**	0.045 (1.589)	-0.272 (0.635)	0.286 (0.924)	-0.120 (2.196)*	0.183	4.806	4.814

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 consistent with the findings of Setyarini (2020). Conversely, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loans has a negative impact on return on equity. This finding is consistent with the findings of Martiningtiyas and Nitinegeri (2020). Similarly, the beta coefficients for credit to deposit ratio are negative with return on equity. It indicates that credit to deposit ratio has a negative impact on return on equity. This finding is consistent with the findings of Golubeva *et al.* (2019). However, 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 Ibrahim (2017). In contrast, 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 similar to the findings of Hoque *et al.* (2020). 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 similar to the findings of Pelealu and Worang (2017). In addition, the beta coefficients for cost efficiency ratio are negative with return on equity. It indicates that cost efficiency ratio has a negative impact on return on equity. This finding is similar to the findings of Antoni and Nasri (2015).

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 analyze the relationship among credit risk, liquidity risk and profitability of Nepalese commercial banks. The study is based on secondary data of 15 Nepalese 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 and liquidity ratio have positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio and liquidity ratio, higher would be the return on assets and return on equity. In contrast, cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, and non-performing loan have negative impact on return on assets and return on equity. It indicates that higher the cash reserved ratio, credit to deposit ratio, cost efficiency ratio, loan loss provision, and non-performing loan, lower would be the return on assets and return on equity. Likewise, the study also concluded that capital adequacy ratio followed by cost efficiency ratio is the most influencing factor that explains the changes in the return on assets of Nepalese commercial banks. Similarly, the study also concluded that cost efficiency 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

- Adolopo, I., R. Lloydking, and V. Tauringana, 2018. Determinants of bank profitability before, during, and after the financial crisis. *International Journal of Managerial Finance* 14 (4) 378-398.
- 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.
- Ahmed, S., M. E. Majeed, E. Thalassinou, and Y. Thalassinou, 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.
- Al-Amin, M., M. S. Rahman, and M. I. Hossain, 2021 Effects of non-performing loan on financial performance: A hypothetical evaluation on all scheduled banks in Bangladesh. *Journal of International Business and Management* 4(9) 01-18.
- 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.
- Al-Jafari, M. K., and M. Alchami, 2014 Determinants of bank profitability: Evidence from Syria. *Journal of Applied Finance and Banking* 4(1), 17-45.
- 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.
- 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.
- Antoni, A., and M. Nasri, 2015. Profitability determinants of Go-Public bank in Indonesia: Empirical evidence after global financial crisis. *International Journal of Business and Management Invention* 4(1), 37-46.
- Brastama, R. F., & 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* 4(12), 43-49.
- Budhathoki, P. B., K. C. Rai, P. Lamichhane, K. G. Bhattarai, and A. Rai, 2020. The impact of liquidity, leverage, and total size on banks' profitability: Evidence from Nepalese commercial banks. *Journal of Economics and Business* 3(2), 123-135.
- Chhetri, G. R., 2021. Effect of credit risk management on financial performance of Nepalese commercial banks. *Journal of Balkumari College* 10(1), 19-30.
- Christian, C., J. S. Moffitt, and L. A. Suberly, 2008. Fundamental analysis for evaluating bank performance: what variables provide the greatest insight into future earnings? *Bank Accounting and Finance* 21(6), 17-25.
- Darmawan, J., B. Laksana, and D. S. Danisworo, 2020. Pengaruh non-performing loan dan BI Rate terhadap return on asset Pada Bank Umum. *Indonesian Journal of Economics and Management* 1(1), 174-183.
- Das, S. K., and K. Uppal, 2021. NPAs and profitability in Indian banks: an empirical analysis. *Future Business Journal* 7(1), 1-9.
- Duraj, B., and E. Moci, 2015. Factors influencing the bank Profitability-Empirical evidence from Albania. *Asian Economic and Financial Review* 5(3), 483-494.
- Ebenezer, O. O., W. Ahmad, and S. Kamil, 2017. Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Nigeria. *International Journal of Finance and Banking Studies: Istanbul* 6(1), 25-38.

- Francis, M. E., 2007. Determinants of commercial bank profitability in Sub-Saharan Africa. *International Journal of Economics and Finance* 5(9), 134-143.
- 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.
- 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 (TURCOMAT)* 12(8), 791-798.
- Hoque, M. A., A. Ahmad, M. 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.
- 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.
- Hutasuhut, A. E., 2019. Factors affecting growth of profit and its impact on the value of banking firms in Indonesia stock exchange 2013-2017. *International Journal of Public Budgeting, Accounting and Finance* 2(4), 1-11.
- Ibrahim, S. S., 2017. The impacts of liquidity on profitability in banking sectors of Iraq: A case of Iraqi commercial banks. *International Journal of Finance and Banking Studies* 6(1), 113-121.
- Khatri, P., 2020. Impact of liquidity on profitability of Nepalese commercial banks. *IOSR Journal of Economics and Finance* 11(5), 26-33.
- Lawati, L., 2021. The effect of loan-to-deposit ratio and debt to equity ratio on return on equity. *Journal Manajemen dan Bisnis* 5(1), 101-107.
- Lipunga, A. M., 2014. Determinants of profitability of listed commercial banks in developing countries: Evidence from Malawi. *Research Journal of Finance and Accounting* 5(6), 41-49.
- Martiningtiyas, C. R., and D. T. Nitinegeri, 2020. The effect of non-performing loans on profitability in banking sector in Indonesia. *International Journal of Management, Accounting, and Economy* 151(1), 64-67.
- Mathuva, D., 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.
- Neupane, B. P., 2020. Profitability determinants of Nepalese commercial banks. *Press Academia Procedia (PAP)* 12(5), 40-45.
- Nshimiyimana, Y. C., and M. A. Zubeda, 2017. The influence of economic factors on profitability of commercial banks. *International Journal of Management and Applied Science* 3(1), 14-18.
- 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.
- 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., 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. *Journal Rise economic Management, Business* 6(4), 3278-3287.

- Power, M., 2005. Invention of operational risk. *Review of International Political Economy* 12(4), 577-599.
- 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.
- 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.
- 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.
- 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.
- Setyarini, A., 2020. Analysis of the effect of CAR, NPL, NIM, BOPO, LDR on ROA (Study on Regional Development Banks in Indonesia for the 2015-2018 Period). *Unisri Research Fair* 4(1), 282-290.
- Singam, J. R. N., 2014. A study on liquidity and profitability of private banks in Sri Lanka. *Research Journal of Finance and Accounting* 5(21), 165-173.
- 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.
- Solihati, G. P., 2020. Analysis of factors affecting banking profitability. *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.
- Suyono, C., S. Teddy, and J. Irawati, 2017. Analysis of Factors Affecting Banking Profitability (Sudi Commercial Bank in 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 (IJCIET)* 10(9), 313-324.
- Vallabh, G., A. Bhatia, and S. Mishra, 2007. Non-performing assets of Indian public, private and foreign sector banks: an empirical assessment. *The IUP Journal of Bank Management* 6(3), 7-28.
- 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.
- Yigermal, M. E., 2017. The determinants of private commercial banks profitability: In the case of selected Ethiopian private banks. *International Journal of Economic Behavior and Organization* 5(1), 25-35.
- 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 16

Impact of non-performing loans, capital adequacy ratio, beta and loan to deposit ratio on profitability of Nepalese Commercial Banks

Bivek Kumar Yadav*

Abstract

This study examines the impact of capital adequacy ratio, non-performing loans, loan deposit ratio and beta 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 non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size. 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 capital adequacy ratio, non-performing loans, loan deposit ratio and beta on the profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive effect on return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In addition, loan to deposit ratio has a negative effect on return on assets and return on equity. It means that increase in loan to deposit ratio leads to decrease in return on assets and return on equity. Moreover, this study showed that loan loss provision has a negative effect 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. Similarly, non-performing loans has a negative effect on return on assets and return on equity. It indicates that increase in non-performing loans leads to decrease in return on assets and return on equity. Furthermore, bank size has a negative effect on return on assets and return on equity. It indicates that increase in bank size leads to decrease in return on assets and return on equity.

Keywords: non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, bank size, profitability

1. Introduction

Banks have a crucial impact on overall economic activities, with respect to their mediation financial processes are essential for fostering economic growth of nation (Monnin and Jokipii, 2010). A robust financial system is imperative for economic advancement. Imala (2005) asserted that the banking infrastructure contributes for enhancing stability to contribute to lay the foundation to promote the long term economic expansion, government and regulatory authorities are responsible for implementing policies that optimize banking performance. A resilient financial system is essential for fostering growth and mitigating the risks of crises among banks. The soundness of the financial infrastructure serves as a crucial catalyst for economic growth by facilitating the transfer of value. Robust bank capital enhances public trustworthiness and assurance in bank's stability (Carmona *et al.*, 2019). One of essential requirements for banks and financial institutions is adequate and sufficient

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

capital. Every bank and financial organizations must keep balance between capital and available risk in its assets in order to guarantee its stability (Leila, 2014). The bank's strategic decisions, such as the focus on low-risk lending or diversification of revenue streams, can influence its risk profile and, consequently, its CAR. Effective risk management strategies and practices can help mitigate risks associated with lending, investment, and other banking activities, consequently improving the CAR. Intense competition within the banking industry may lead to aggressive lending practices or pricing strategies, which can affect asset quality and risk profiles, subsequently impacting the CAR. Bank soundness is the bank's ability to carry out operational activities and be able to properly fulfill all obligations in accordance with existing. Diamond and Rajan (2000) stated that high capital reduces banks' liquidity creation but allows them to be strong and avoid bankruptcy. Banking institutions are companies that specialize in financial intermediation, which involves distributing excess liquidity among various economic participants. Bank lending is the primary source of revenue for banks, and it looks to be the riskiest component of banking due to the variety of hazards involved. Capital is one of the bank specific factors that influence the level of bank profitability. Capital must be sufficient to protect losses and fulfil its obligations to account holders. Capital adequacy ratio determines the capital adequacy of a bank in term of meeting the time liability and other risks such as credit risk, market risk, operational risk, and others. 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 (Ryu *et al.*, 2012). 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. Banks are exposed to different types of risks, which affect the performance and activity of the banks, since the primary goal of the banking management is to maximize the shareholders' wealth. So, to achieve this goal banks' managers should asses the cash flows and the assumed risks as a result of directing its financial resources in different areas of utilization.

Setiawati *et al.* (2022) demonstrated that the CAR exert a favorable and substantial impact with respect to the profitability of banking institution. Conversely, non-performing finance (NPF) was found to have a detrimental and inconsequential impact on bank earnings. Additionally, Surtikanti *et al.* (2022) examined the effects of CAR on bank earnings, specifically return on assets among publicly listed foreign exchange banks on the Indonesian Stock Exchange from the time frame 2011 to 2015. The findings indicated that CAR substantially affects revenue generation. Widyakto *et al.* (2021) identified that NIM plays a crucial favorable role in return on equity (ROE), whereas non-performing loans (NPL) have a substantial detrimental effect on ROE. Aburime (2008) determined that the importance of bank profitability can be assessed from both microeconomic and macroeconomic perspectives. On the microeconomic side, profitability serves as a fundamental requirement for a competitive banking institution and represents the most cost-effective source of capital. It is not only an outcome but also a critical necessity for thriving in an increasingly competitive financial landscape. Consequently, the primary objective of bank management is to optimize profit, which is vital for effective business operations. From a macroeconomic point of view, a robust and profitable banking sector is more resilient to adverse shocks and plays a crucial part in securing the stability of the financial system. Al-Sharkas *et al.* (2022) investigated the effects of CAR on bank profitability within the Jordanian context, utilizing static panel data from a sample of 24 banks over the period from 2008 to 2018. The study employed multiple linear regression analysis, revealing that return on assets (ROA) is negatively correlated with the four capital adequacy ratios. Conversely, return on equity (ROE) is positively influenced by the

core capital to risk-weighted assets ratios and the total capital to risk-weighted assets ratio. However, ROE is negatively impacted by the core capital to total assets ratio and the total equity capital to total assets ratio.

Swandewi *et al.* (2021) assessed the impact of non-performing loans on return on assets, utilizing the capital adequacy ratios as a mediating factor. The study found a substantial and unfavorable correlation between non-performing loans and the capital adequacy ratio. In a separate investigation, Brastama *et al.* (2020) evaluated the influence of profit margin in mediating the relationship between the capital adequacy ratio (CAR) and non-performing loan (NPL) on bank's stocks prices. The study indicated that the CAR positively influences return on assets, while the NPL negatively impacts the ROA. Furthermore, the CAR positively affects stock prices, whereas the NPL has a detrimental effect on stock prices. Yulianti *et al.* (2018) examined the relationship between capital adequacy, bank size, and non-performing loan in Indonesian public banks. The results demonstrated that the capital adequacy ratio positively influences non-performing loans, while bank size and loan to deposit ratio negatively affect non-performing loans. Lastly, Silaban (2017) investigated the health of banks by analyzing the capital adequacy ratio and non-performing loans both individually and mutually in relation to bank profitability. The study revealed that the capital adequacy ratio does not significantly impact bank earnings.

In Nepalese context, Gurung and Gurung (2022) investigated the multiple factors influencing the earnings of commercial banks. The study revealed that non-performing assets have a weak impact on return on assets, yet it exert a significant unfavorable influence on return on equity. In a related study, Bhattarai (2020) identified non-performing loan as a critical issue within the banking sector, revealing that NPL, CAR, and liquidity are significantly and unfavorably correlated with return on equity (ROE). Additionally, Pradhan and Parajuli (2017) examined the effects of capital adequacy and cost-income ratio, on the financial outcomes of commercial banks in Nepal. The study revealed a negative relationship between capital adequacy, cost-income ratio, equity capital to total assets ratio, and liquidity ratio with return on assets.

Gyawali (2018) conducted an analysis of non-performing assets and their influence on the financial outcomes of commercial banks in Nepal. The study revealed a negative relationship between non-performing loans and return on assets within the environment of Nepalese commercial banks. Additionally, it was observed that an increase in the proportion of non-performing loans, along with the size of the bank, correlates with a decrease in the financial outcomes of these institutions. Bhattarai (2018) investigated the effects of both bank-oriented and economic variables on the outcomes of Nepalese commercial banks. The study identified that the capital adequacy ratio and exchange rate employ a declining and noteworthy influence on return on assets. Moreover, it was found that default risk, GDP growth, and inflation have a positive yet insignificant effect on return on assets.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of capital adequacy ratio, non-performing loans, loan deposit ratio and beta on the profitability 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 impact of capital adequacy ratio, non-performing loans, loan deposit ratio and beta on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size on return on assets and return on equity 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 has employed convenience sampling method. The main sources of data are Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of different sample banks, supervision report of Nepal Rastra Bank and websites of respective 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 Bank Limited	2014/15-2022/23	9
2	Rastriya Banijya Bank Limited	2014/15-2022/23	9
3	Himalayan Bank Limited	2014/15-2022/23	9
4	Everest Bank Limited	2014/15-2022/23	9
5	NMB Bank Limited	2014/15-2022/23	9
6	Standard Chartered Bank Nepal Limited	2014/15-2022/23	9
7	Nepal SBI Bank Limited	2014/15-2022/23	9
8	Machhapuchchhre Bank Limited	2014/15-2022/23	9
9	Sanima Bank Limited	2014/15-2022/23	9
10	Siddhartha 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 profitability of banks depends upon capital adequacy ratio, non-performing loans, loan deposit ratio and beta. The dependent variables selected for the study are capital adequacy ratio and core capital ratio. Similarly, the selected independent variables are non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size. Therefore, the models take the following forms

$$ROA = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 LLP + \beta_5 LIQ + \beta_6 INF + \beta_7 BS + e_{it}$$

$$ROE = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 LLP + \beta_5 LIQ + \beta_6 INF + \beta_7 BS + e_{it}$$

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.

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.

LDR = Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage.

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

INF = Inflation as measured by the change in consumer price index, in percentage.

LIQ = Bank liquidity as measured by the ratio of total liquid assets to total deposits, in percentage.

BS = 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:

Non-performing loan

Non-performing loan (NPLs) represent a ratio that compares the volume of loans that are not being repaid by borrowers to the total amount of credit extended by banks to those borrowers. A higher NPL ratio indicates a more detrimental situation for banks, as an increased number of non-performing loans can adversely affect return on assets (ROA) (Laryea et al., 2016). Kwashie (2022) demonstrated that non-performing loans negatively influence financial performance metrics. Similarly, Safitri and Oktavia (2022) identified a substantial negative influence of NPLs on ROA. Bandara et al. (2021) also confirmed a substantial negative association between non-performing loans and return on assets. Additionally, Trujillo-Ponce (2013) assessed the factors influencing proficiency of commercial bank in Spanish and discovered that NPLs negatively impacted both ROA and ROE. Furthermore, Felix and Claudine (2008) established negative association between profitability measures, ROA and ROE, and the ratio of non-performing loan to total loans. Altunbas et al. (2000) revealed a negative correlation between the NPL ratio and performance of banks. Pham (2013) analyzed the effects of NPLs on the financial performance of commercial bank in Vietnam from 2005 to 2012, revealing a negative correlation with profitability of banks. Based on it, this study develops the following hypothesis:

H₁: Non performing loans are negatively associated with the profitability of banks.

Capital adequacy ratio

The capital adequacy requirement is designed to safeguard against losses that exceed the current earnings of the bank, thus safe guarding saving account holder and financiers (Ikpefan, 2013). Lin et al. (2005) asserted that having sufficient capital enables banks to absorb potential losses, safeguarding their operation their operations against failures. Hersugondo et al. (2021) revealed

that capital adequacy exerts a negative influence on bank profit. Likewise, Dao and Nguyen (2020) identified a negative correlation between capital adequacy ratio and financial performance. In addition, Al-Homaidi et al. (2020) revealed that the capital adequacy ratio significantly negatively affects return on assets. Furthermore, Islam et al. (2020) validated that the capital adequacy ratio has a negative influence on overall bank outcomes. Additionally, Ogboi and Unuafé (2013) concluded that effective credit risk management, together with the capital adequacy ratio, enhances the financial performance. Furthermore, Moussa (2015) established a negative association between the capital ratio and financial outcomes. Barus et al. (2017) revealed that capital adequacy is negatively associated with return on assets and return on equity. Based on it, this study develops the following hypothesis:

H₂: Capital adequacy ratio has a negative relationship with bank profitability.

Loan-to-deposit ratio

Abreu and Mendes (2002) found a statistically positive correlation between the loans to deposit ratio and the financial performance of banks. Sharifi and Akhter (2016) established that the credit to deposit ratio favorably affects the financial performance of the banks of the public sector. Ulandari et al. (2016) also confirmed that the loan to deposit ratio contributes positively to profitability. Additionally, Shafana (2015) demonstrated that the credit to deposit ratio significantly enhances the financial performance banks. Bolek and Wilinski (2012) revealed that the credit to deposit ratio positively influences profitability. Conversely, Chowdhury and Zaman found an inverse between the credit to deposit ratio both return on assets and return on equity. Rengasamy (2014) found a substantial favorable influence on the credit to deposit ratio on return on assets. Similarly, Sari et al. (2017) examined the impact of non-participant's funds, capital adequacy ratio, and loan to deposit ratio on bank financial performance following the implementation of IFRS, concluding that the loan to deposit ratio has a positive but statistically insignificant influence on return on assets. Jeslin (2017) explored the influence of credit risk on bank financial performance, revealing a positive effect of the loan to deposit ratio on return on equity. Hapsari (2018) assessed the relationship between loan to deposit ratio and non-performing loans ratio concerning profitability, finding a positive correlation between the loan to deposit ratio and return on assets. Soegeng et al. (2018) also indicated a positive influence of the loan to deposit ratio on return on assets. Likewise, Hadian and Phety (2021) confirmed the positive influence of the loan to deposit ratio on return on assets. Based on it, this study develops the following hypothesis:

H₃: Loan to deposit ratios has a positive relationship with bank profitability.

Liquidity

Liquidity ratios serve as indicators of a bank's liquidity position. Hongli et al. (2019) demonstrated that liquidity, assessed through the ratio of current assets to current liabilities, has a significantly favorable influence on return on equity (ROE). Similarly, Lartey et al. (2013) also found a positive association between liquidity and financial performance among listed banks in Cihana. Additionally, Mahdi and Abbes (2018) indicated that a bank's profitability, as measured by ROA, is positively correlated with both capital and bank liquidity. Lastly, Lukorito et al. (2014) discovered a statistically significant and favorable association between liquidity and the financial performance of banks. Based on it, this study develops the following hypothesis:

H₄: Liquidity has a positive relationship with bank profitability.

Inflation

Inflation index (CPI) assesses the cost of consumer goods by weighing their significance in total expenditure. Inflation influences the performance of banks, prompting them to adjust interest rates in anticipation of inflationary trends. This adjustment can enhance profitability by fostering revenue growth at a pace that outstrips cost increases. Hadian and Phety (2021) revealed that the banking sector's profitability has risen in conjunction with a decrease in the inflation rate. Islam et al. (2020) identified a long-term unfavorable impact of inflation on the development of credit markets. Similarly, Lartey et al. (2013) established a negative correlation between inflation and financial performance. Additionally, Kaaya and Pastory (2013) revealed a negative association between inflation and financial performance within the Tanzanian banking sector, suggesting that inflation in Tanzania is largely predictable, leading to corresponding adjustments in interest rates. Furthermore, Safitri and Oktavia (2022) found that inflation significantly and negatively affects both Return on Assets (ROA) and Return on Equity (ROE). Based on it, this study develops the following hypothesis:

H₅: Inflation is negatively related to bank profitability.

Bank size

Aladwan (2015) examined the impact of bank size on financial performance among Jordanian enlisted commercial banks. The findings indicated a positive correlation between bank size, as determined by total assets, and profitability. In a similar way, Halkos and Salamouris (2004) assessed the efficiency of Greek commercial banks through financial ratios, concluding that greater bank assets correspond to enhanced efficiency. Furthermore, Mule et al. (2015) examined the relationship between corporate size profitability and firm value among companies listed on the Nairobi Securities exchange, utilizing data from 2010 to 2014. The study showed a significant positive association between firm size and return on equity. Additionally, Rudhani et al. (2016) explored the impact of core factors on the financial performance of commercial banks in Kosovo, revealing that bank size positively influences return on assets. Bagchi (2013) also noted a strong favorable relationship between bank size and financial performance. Likewise, Saliha and Abdessatar (2011) identified a positive association between firm size and profitability. Based on it, this study develops the following hypothesis:

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

Loan loss provision

Loan loss provision refers to the expenses allocated as reserves for potential losses from bad loans, including instances of customer defaults. It serves as a safeguard against credit losses within the loan portfolio and associated funding, reflecting a decline in economic value (Budiarti, 2012). Alhadab and Alsahawneh (2016) indicates that loan loss provision adversely affects the financial performance of commercial banks in Jordan. Mustafa et al. (2012) also highlighted an unfavorable association between profit and loan loss provision. Furthermore, Ahmad et al. (2014) confirmed a negative association between loan loss provision (LLP) and outcome metrics such as return on assets (ROA) and return on equity (ROE). Kaaya and Pastory (2013) demonstrated that both loan loss provision and non-performing loans negatively influence bank outcomes. Ahmad et al. (2014) emphasized that a lower loan loss provision correlates with higher financial performance and enhanced safety. In contrast, Zoubi and Al-Khazali (2007) posited that loan loss provision (LLP) positively impacts bank profitability. Based on it, this study develops the following hypothesis:

H₇: There is a negative relationship between loan loss provision and bank 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 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 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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision is measured by loan loss provision to total loans, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), LIQ (Bank liquidity as measured by the ratio of total liquid assets to total deposits, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.22	1.56	0.48
ROE	3.78	44.22	14.90	5.35
NPL	0.01	4.93	1.44	1.28
CAR	7.49	22.99	13.61	2.19
LDR	48.32	96.70	81.06	10.14
LLP	0.39	10.39	2.19	1.87
LIQ	2.89	39.02	15.65	8.95
INF	4.19	9.90	6.07	2.00
BS	19.16	394.02	144.20	75.08

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 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 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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP

(Loan loss provision is measured by loan loss provision to total loans, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), LIQ (Bank liquidity as measured by the ratio of total liquid assets to total deposits, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Variables	ROA	ROE	NPL	CAR	LDR	LLP	LIQ	INF	BS
ROA	1								
ROE	0.640**	1							
NPL	-0.150	-0.076	1						
CAR	0.196*	-0.265**	-0.334**	1					
LDR	-0.245*	-0.397**	-0.155	-0.109	1				
LLP	-0.404**	-0.303**	0.595**	-0.139	0.028	1			
LIQ	-0.047	0.078	0.152	-0.110	0.026	0.113	1		
INF	-0.091	0.184	0.160	-0.373**	-0.187	0.088	-0.037	1	
BS	-0.464**	-0.366**	0.461**	-0.078	0.101	0.782**	0.175	0.033	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 capital adequacy ratio and return on assets. It indicates that increase in capital adequacy ratio 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 loan to deposit ratio and return on assets. It means that increase in loan to deposit ratio leads to decrease in return on assets. In addition, this study shows that there is 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. Moreover, there is negative relationship between liquidity and return on assets. It means that decrease in liquidity leads to increase in return on assets. Similarly, there is negative relationship between non-performing loans and return on assets. It indicates that increase in non-performing loans leads to decrease in return on assets. Furthermore, there is negative relationship between bank size and return on assets. It indicates that increase in bank size leads to decrease in return on assets.

On the other hand, the result shows that there is a negative relationship between capital adequacy ratio and return on equity. It indicates that increase in capital adequacy ratio 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 loan to deposit ratio and return on equity. It means that increase in loan to deposit ratio leads to decrease in return on equity. In addition, this study shows that there is 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. Moreover, there is positive relationship between liquidity and return on equity. It means that increase in liquidity leads to increase in return on equity. Similarly, there is negative relationship between non-performing loans and return on equity. It indicates that increase in non-performing loans leads to decrease in return on equity. Furthermore, there is negative relationship between bank size and return on equity. It indicates that increase in bank size 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 Table 5. More specifically, Table 4 shows the regression results of non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity,

inflation, and bank size on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size 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 linear regression model. The model is $ROA = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 LLP + \beta_5 LIQ + \beta_6 INF + \beta_7 BS + e_{it}$ 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 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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision is measured by loan loss provision to total loans, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), LIQ (Bank liquidity as measured by the ratio of total liquid assets to total deposits, 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
		NPL	CAR	LDR	LLP	LIQ	INF	BS			
1	1.647 (23.569)**	-0.057 (1.566)							0.013	0.481	2.451
2	0.977 (3.372)**		0.043 (2.059)*						0.029	0.477	4.238
3	2.515 (6.850)			-0.12 (2.067)*					0.051	0.471	6.798
4	1.795 (27.095)**				-0.104 (4.548)**				0.155	0.445	20.681
5	1.605 (16.977)**					-0.003 (0.485)			0.007	0.486	0.235
6	1.699 (11.364)**						-0.022 (0.945)		0.001	0.484	0.892
7	1.997 (22.155)**							-0.003 (5.400)**	0.208	0.431	29.161
8	1.124 (3.415)**	-0.036 (0.945)	0.036 (1.625)						0.028	0.477	2.564
9	2.284 (4.256)**	-0.057 (1.502)	0.026 (1.184)	-0.012 (2.691)**					0.083	0.464	4.226
10	2.005 (4.004)**	-0.057 (1.301)	0.036 (1.737)*	-0.009 (2.144)**	-0.121 (4.301)**				0.215	0.429	8.326
11	2 (3.937)**	-0.057 (1.284)	0.036 (1.73)	-0.009 (2.135)*	-0.121 (4.28)**	0.0001 (0.065)			0.207	0.431	6.597
12	2.23 (3.589)**	-0.056 (1.255)	0.03 (1.334)	-0.01 (2.222)*	-0.119 (4.217)**	0.000047 (0.01)	-0.015 (0.645)		0.203	0.432	5.536
13	2.23 (3.589)**	-0.06 (1.381)	0.035 (1.584)	-0.008 (1.909)	-0.047 (1.207)	0.002 (0.392)	-0.015 (0.654)	-0.002 (2.699)	0.249	0.419	6.081

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 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 finding of Bandara et al. (2021). Similarly, 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 finding of Barus et al. (2017). 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 Safitri and Oktavia (2022). Further, the beta coefficients for loan deposit ratio are negative with return on assets. It indicates that loan deposit ratio has a negative impact on return on assets. This finding is consistent

with the findings of Soegeng et al. (2018). In addition, the beta coefficients for liquidity are negative with return on assets. It indicates that liquidity has a negative impact on return on assets. This finding is consistent with the finding of Mahdi and Abbes (2018). Likewise, 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 Zoubi and Al-Khazali (2007). Likewise, the beta coefficients for bank size are negative with return on assets. It indicates that bank size has a negative impact on return on assets. This finding is similar to the findings of Bagchi (2013).

Table 5 shows the regression results of non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of non-performing loans, capital adequacy ratio, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size 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 linear regression model. The model is $ROE = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 LLP + \beta_5 LIQ + \beta_6 INF + \beta_7 BS + e_{it}$ 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 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), LDR (Loan-to-deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision is measured by loan loss provision to total loans, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), LIQ (Bank liquidity as measured by the ratio of total liquid assets to total deposits, in percentage) and BS (Bank size as measured by total assets, Rs. in billions).

Model	Intercept	Regression coefficients of							Adj. R ²	SEE	F-value
		NPL	CAR	LDR	LLP	LIQ	INF	BS			
1	15.363 (19.728)**	-0.318 (0.787)							0.004	5.363	0.619
2	23.684 (7.526)**		-0.645 (2.826)**						0.061	5.187	7.984
3	31.862 (8.293)**			-0.209 (4.448)**					0.149	4.938	19.782
4	16.806 (22.037)**				-0.864 (3.270)**				0.083	5.126	10.691
5	14.177 (13.599)**					0.046 (0.803)			0.003	5.362	0.645
6	11.923 (7.310)**						0.491 (1.924)		0.025	5.287	3.702
7	18.672 (17.84)**							-0.026 (4.054)**	0.126	5.005	16.434
8	26.845 (7.598)**	-0.773 (1.885)	-0.795 (3.324)**						0.083	5.125	5.864
9	51.192 (9.919)**	-1.211 (3.319)**	-1.009 (4.773)**	-0.257 (5.875)**					0.305	4.462	16.665
10	49.349 (9.794)**	-0.503 (1.135)	-0.946 (4.596)**	-0.236 (5.508)**	-0.797 (2.824)**				0.349	4.32	15.331
11	48.473 (9.551)**	-0.503 (1.135)	-0.931 (4.527)**	-0.238 (5.562)**	-0.807 (2.865)**	0.058 (1.237)			0.352	4.309	12.634
12	48.235 (7.758)**	-0.502 (1.126)	-0.925 (4.12)**	-0.237 (5.346)**	-0.808 (2.849)**	0.059 (1.233)	0.016 (0.067)		0.346	4.33	10.427
13	47.937 (7.812)**	-0.474 (1.077)	-0.891 (4.01)**	-0.226 (5.111)**	-0.275 (0.701)	0.072 (1.511)	0.018 (0.076)	-0.017 (1.938)	0.363	4.272	9.717

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 non-performing loans are negative with return on equity. It indicates that non-performing loans has a negative impact on return on equity. This finding is similar to the finding of Kwashie (2022). In contrast, 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 consistent with the finding of Hersugondo et al. (2021). Likewise, the beta coefficients for inflation rate are positive with return on equity. It indicates that inflation rate has a positive impact on return on equity. This finding is consistent with the finding of Hadian and Phety (2021). Further, the beta coefficients for loan deposit ratio are negative with return on equity. It indicates that loan deposit ratio has a negative impact on return on equity. This finding is consistent with the findings of Bolek and Wilinski (2012). In addition, the beta coefficients for liquidity are positive with return on equity. It indicates that liquidity has a positive impact on return on equity. This finding is consistent with the finding of Mahdi and Abbes (2018). Likewise, 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 Kaaya and Pastory (2013). Likewise, the beta coefficients for bank size are negative with return on equity. It indicates that bank size has a negative impact on return on equity. This finding is similar to the findings of Halkos and Salamouris (2004).

4. Summary and conclusion

Profitable banks are better equipped to invest in advanced risk management practices, such as implementing robust credit assessment processes, maintaining sufficient liquidity reserves, and diversifying their asset portfolios. These measures help minimize risks and reduce the chances of insolvency. Furthermore, strong profitability reflects a bank's higher capacity to generate earnings, enabling a more significant contribution to economic development. Maintaining healthy and sustainable profitability is crucial for ensuring the stability of the banking system and fostering overall economic growth. Profitability provides banks with the necessary capital reserves to absorb potential losses, particularly during economic downturns or financial crises, thereby preventing bank failures and mitigating systemic risks that could jeopardize the financial system.

This study attempts to examine the impact of capital adequacy ratio, non-performing loans, loan deposit ratio and beta on the 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 non-performing loans, loan deposit ratio, loan loss provision, liquidity, inflation, and bank size have negative effect on return on assets of Nepalese commercial banks. High levels of non-performing loans and loan loss provisions signify deteriorating asset quality, which directly erodes profitability. Similarly, an imbalanced loan-to-deposit ratio and suboptimal liquidity management can strain operational efficiency and financial stability. Inflation further exacerbates these challenges by increasing operational costs and reducing the real value of returns. Moreover, larger bank size, while often associated with economies of scale, may lead to inefficiencies that negatively affect ROA. However, capital adequacy ratio has a positive effect on return on assets. Likewise, the study also concluded that bank size followed by loan loss provision is the most influencing factor that explains the changes in the return on assets 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.
- Aburime, T., 2008. Determinants of bank profitability: Industry-level evidence from Nigeria. *International Journal of Nigerian Studies and Development* 14(1), 21-34.
- Ahmad, F., S. H. Tahir, and B. Aziz, 2014. Impact of loan loss provision on bank profitability in Pakistan. *TLJ's Research Journal of Social Science and Management* 3(12), 34-41.
- Aladwan, M. S., 2015. The impact of bank size on profitability: An empirical study on listed Jordanian commercial banks. *European Scientific Journal* 11(34), 217-234.
- Alhadab, M., and S. Alsahawneh, 2016. Loan loss provision and the profitability of commercial banks: evidence from Jordan. *International Journal of Business Management* 11(12), 242-249.
- 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.
- 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), 12-24.
- 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.
- Bagchi, B., 2013. Liquidity-profitability relationship: Empirical evidence from Indian fast moving consumer goods firms. *International Journal of Applied Management Science* 5(4), 355-376.
- 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.
- Barus, J. J., W. Muturi, P. Kibati, and J. Koima, 2017. Effect of capital adequacy on the financial performance of savings and credit societies in Kenya. *American Journal of Finance* 1(4), 1-12.
- Bhattarai, B. P., 2018. Impact of bank specific and macroeconomic variables on performance of Nepalese commercial banks. *Global Review of Accounting and Finance* 9(1), 35-53.
- Bhattarai, B. P., 2020. Effects of non-performing loan on profitability of commercial banks in Nepal. *European Business and Management* 6(6), 164-170.
- 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.
- 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* 4(12), 43-49.
- 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.
- Chowdhury, M. M., and S. Zaman, 2018. Effect of liquidity risk on performance of Islamic banks in

- Bangladesh. *Journal of Economics and Finance* 9(4), 1-9.
- Dao, B. T. T., and D. P. Nguyen, 2020. Determinants of profitability in commercial banks in Vietnam, Malaysia and Thailand. *The Journal of Asian Finance, Economics and Business* 7(4), 133-143.
- Diamond, D. W., and R. G. Rajan, 2000. A theory of bank capital: Center for research in security prices. *The Journal of Finance* 55(6), 2431-2465.
- Felix, A. T., and T. N. Claudine, 2008. Bank performance and credit risk management. *The International Journal of Business and Management* 5(7), 1-15.
- Gurung, J. B., and N. Gurung, 2022. Factors determining profitability of commercial banks: Evidence from Nepali Banking Sector. *Prithvi Academic Journal* 5(1) 100-113.
- Gyawali, A., 2018. Non-performing asset and its effects on the financial performance of Nepalese commercial banks. *International Journal of Research in Business Studies and Management* 5(9), 39-47.
- Hadian, N., and D. T. O. Phety, 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.
- Halkos, G. E., and D. S. Salamouris, 2004. Efficiency measurement of the Greek commercial banks with the use of financial ratios: A data envelopment analysis approach. *Management Accounting Research* 15(2), 201-224.
- Hapsari, I., 2018. Moderating role of size in the effect of loan to deposit ratio and non-performing loan toward banking financial performance. *Advances in Social Science, Education and Humanities Research* 231(1), 351-354
- Hersugondo, H., N. Anjani, and I. D. Pamungkas 2021. The role of non-performing asset, capital, adequacy and insolvency risk on bank performance: A case study in Indonesia. *The Journal of Asian Finance, Economics and Business* 8(3), 319-329.
- Hongli, J., E. S. Ajorsu, and 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.
- Ikpefan, O. A., 2013. Capital adequacy, management and performance in the Nigerian commercial bank (1986-2006). *African Journal of Business Management* 7(30), 2938-2950.
- Imala, O. I., 2005. Challenges of banking sector reforms and bank consolidation in Nigeria. *Bullion* 29(2), 4-9.
- Islam, M. N., A. Akter, M. J. Alam, and A. H. M. Shahriar, 2020. Analyzing how credit risk influences the performance of commercial banks in Bangladesh: A quintile regression modeling. *International Journal of Banking, Risk and Insurance* 8(2), 14-26.
- Jeslin, S. J., 2017. A study on the impact of credit risk on the profitability of State Bank of India (SBI). *ICTACT Journal on Management Studies* 3(2), 538-542.
- 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.
- 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

- Lartey, V. C., S. Antwi, and 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.
- 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.
- Leila, H. V., 2014. The influential factors on capital adequacy ratio in Iranian banks. *International Journal of Economics and Finance* 6(11), 108-116.
- Lin, S. L., J. H. Penm, S. C. Gong, and C. S. Chang, 2005. Risk-based capital adequacy in assessing on insolvencyrisk and financial performances in Taiwan's banking industry. *Research in International Business and Finance* 19(1), 111-153.
- Lukorito, S. N., W. Muturi, A. S. Nyang'au, and D. Nyamasege, 2014. Assessing the effect of liquidity on profitability of 16 Perspectives in Nepalese Management commercial banks in Kenya. *Research Journal of Finance and Accounting* 5(19), 145-152.
- Mahdi, I. B. S., and M. B. Abbes, 2018. Relationship between capital, risk and liquidity: a comparative study between Islamic and conventional banks in MENA region. *Research in International Business and Finance* 45(1), 588-596.
- Monnin, P., and T. Jokipii, 2010. The impact of banking sector stability on the real economy. *Swiss National Bank Working Papers*, No. 05.
- Moussa, M. A. B., 2015. The determinants of bank liquidity: Case of Tunisia. *International Journal of Economics and Financial Issues* 5(1), 249-259.
- 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.
- 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.
- Ogboi, C., and O. K. Unuafé, 2013. Impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking* 2(3), 703-717.
- 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.
- Rengasamy, D., 2014. Impact of loan deposit ratio (LDR) on profitability: Panel evidence from commercial banks in Malaysia. *Global Economics, Finance and Social Sciences* 1(1), 1-12
- Rudhani, L. H., S. Ahmeti, and T. Rudhani, 2016. The impact of internal factors on bank profitability in Kosovo. *Acta Universitatis Danubius: Oeconomica* 12(1), 95-107.
- 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.
- 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.
- Saliha, T., and A. Abdessatar, 2011. The determinants of financial performance: An empirical test using the

simultaneous equations method. *Economics and Finance Review* 10(1), 1-19.

- Sari, Y. A. N., and N. S. I. M. Murni, 2017. Analysis of the effect of third-party fund, capital adequacy ratio, and loan to deposit ratio on bank's profitability after the application of IFRS. *The Indonesian Accounting Review* 6(1), 81-90.
- Setiawati, N. M. P., I. W. Widnyana, and I. G. N. B. Gunadi, 2022. Pengaruh capital adequacy ratio, non performing finance, dan net interest margin terhadap profitabilitas pada bank umum syariah. *VALUES* 3(1), 202-218.
- Shafana, M., 2015. Liquidity and profitability of financial institutions in Sri Lanka. *International Journal of Science and Research* 4(6), 589-593.
- 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.
- 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.
- Soengeng, F. X., V. R. Inggawati, and H. W. Oetomo 2018. Effect of loan to deposit ratio (LDR), non-performing loan (NPL), net interest margin (NIM) on return on assets (ROA) with ATM as moderation variables. *Saudi Journal of Economics and Finance* 2(5), 247-250.
- Surtikanti, S., A. Saepudin, Y. Arizona, and S. D. Anggadini, 2022. The influence of capital adequacy ratio (car) and net interest margin (NIM) on profitability (survey on foreign exchange commercial banks listed in Indonesia Stock Exchange the year 2011-2015). *Indonesian Journal of Economics, Social, and Humanities* 4(2), 111-122.
- 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.
- Trujillo-Ponce, A., 2013. What determines the profitability of banks? Evidence from Spain. *Accounting and Finance* 53(2), 561-586.
- 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.
- Widyakto, A., Y. Suhardjo, and A. Ardiansari, 2021. Analysis of the impact of NIM, LDR and NPL on bank profitability with variable mediating firm size (empirical study on public banks listed on IDX in 2015-2019). *Management Analysis Journal* 10(3), 257-263.
- Yulianti, E., A. Aliamin, and R. Ibrahim, 2018. The effect of capital adequacy and bank size on non-performing loans in Indonesian public banks. *Journal of Accounting Research, Organization and Economics* 1(2), 205-214.
- Zoubi T.A., and O. Al-Khazali, 2007. Empirical testing of the loss provisions of banks in the GCC region. *Managerial Finance* 33(7), 50-61.

Chapter 17

Factors Affecting IPO Underpricing in Nepal

Suman Paudel*

Abstract

This study examines the factors affecting IPO underpricing in Nepal. Raw initial return and market adjusted initial return are selected as dependent variables. The selected independent variables are issue price, issue size, age of the firm, firm size, and earning per share. The primary source of data is used to assess the opinions of the respondents regarding issue price, issue size, age of the firm, firm size, earning per share, raw initial return, and market adjusted initial return. The study is based on primary data of 105 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 factors affecting IPO underpricing in Nepal.

The study showed that issue price has a positive impact on raw initial return and market adjusted initial return. It implies that increase in issue price leads to increase in raw initial return and market adjusted initial return. Similarly, issue size has a positive impact on raw initial return and market adjusted initial return. It indicates that increase in issue size leads to increase in raw initial return and market adjusted initial return. The result also revealed that age of the firm has a positive impact on raw initial return and market adjusted initial return. It indicates that older firms lead to increase in raw initial return and market adjusted initial return. Likewise, firm size has a positive impact on raw initial return and market adjusted initial return. It indicates that increase in firm size leads to increase in raw initial return and market adjusted initial return. Further, earning per share has a positive impact on raw initial return and market adjusted initial return. It indicates that higher the earning per share, higher would be the raw initial return and market adjusted initial return.

Keywords: issue price, issue size, age of the firm, firm size, earning per share, raw initial return, market adjusted initial return

1. Introduction

Underpricing could be a condition in which the batch value of stock within the primary market is lower than in the secondary market. While the opposite condition can be said to be overpricing (Syapril *et al.*, 2019). Initial Public Offering (IPO) is one of the most important financial decisions which attract many researchers to focus on reasons and different aspects of going public. IPO is the first issuance of securities with the purpose of selling to the public (Bukh *et al.*, 2005). IPO is exchanging securities with cash to raise the firms' capital. This exchange would happen in primary market, where issuers and investors meet each other. It means, firms that have issued security are unaffected by secondary market transactions (Booth, 2007). An IPO is a company's activity in offering and selling its shares to the public. Determining the initial share price is difficult, because the company does not have experience in selling shares to the public. This causes the company to have the potential to get an initial offering price under underpricing which is a problem for companies conducting IPOs (Cucculelli *et al.*, 2021). Underpricing conditions cause losses to the company, because which does not get the maximum public funds. In order to gain higher fees, investment banks tend purposefully underprice as well. According to Wijayanto (2009), the earning per share is a proxy for the company's earnings per share which is expected to provide an overview for investors regarding the share of profits that can be obtained in a certain period by owning a share. In general, shareholders and potential investors will be

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

interested in earning per share, because earning per share describes the amount of money earned for each share and large earning per share is an indicator of the success of the issuer.

An Initial Public Offering (IPO) is the original sale of company's securities to the wider public for the first time in the primary markets (Myers and Brealey, 2003). Public offerings involve raising of funds for corporations from the public through the issuance of various securities in the primary market and is often the only major source of obtaining large and long-term funds. There are especially two areas within initial public offerings that cause wonder for researcher around the world: the evidence of initial underpricing and the long run underperformance. Why do companies choose to go public if these two issues are as consistent as prior evidences show? Why do IPO firms put themselves out on the market at a lower price than the fair value, leaving money at the table and why do firms still want to go if they are likely to underperform in the long run? In most cases of IPO, the offering price is systematically lower than its closing price on the first trading day. Because of this, investors can enjoy great benefits by purchasing IPOs on the first trading day and sell them on the second trading day or few trading days later. This phenomenon is called "IPO underpricing" and it has been extensively documented in different stock markets around the globe. IPO underpricing, or high IPO return is a phenomenon common to most stock markets, regardless of whether these markets are in developed or emerging economies (Ritter, 1984). Though IPOs performances have been well documented in the finance literature, most of the studies have focused on the US, Western Europe and other G7 developed economies (Alli *et al.*, 2010).

International evidence on the initial return of IPOs reveals that on average, IPOs are underpriced. The degree of underpricing of developed capital markets is generally lower than that of emerging capital markets. Underpricing of 6 to 20 percent is commonly found in developed markets but in emerging markets 100 to 200 is common and in China it may reach as high as 948 percent (Su and Fleisher, 1999). Most early evidence of IPOs underpricing comes from studies of U.S. capital markets. For instance, Ibbotson (1975) using a sample of 771 IPOs listed from 1961-1969 and found that average initial return of 11.4 percent. Similarly, Jenkinson and Mayer (1988) and Husson and Jacquillat (1990) reported that average initial return is 25.10 percent and 4 percent respectively for French markets. Likewise, Menyah *et al.* (1995) investigated the initial returns and long-run performance of private-sector and privatization IPOs in the U.K. The study found a significant underpricing of 3.4 percent for private-sector IPOs and 38.7 percent for privatization IPOs. Further, Kunz and Aggarwal (1994) found an average initial return of 35.8 percent in Switzerland. In addition, Aussenegg (2001) and Jelic and Briston (2003) reported that an average initial return of 35.57 percent and 27.40 percent respectively in Poland.

Katti and Phani (2016) examined determinants of underpricing of IPOs regarding financial and non-financial firms in Pakistan. The study found that ex-ante uncertainty, offer size, market capitalization and over-subscription are the only significant factors both in financial and non-financial firms in determining the level of underpricing. Similarly, Mumtaz and Ahmed (2014) investigated the determinants of underpricing of initial public offerings: Evidence from Pakistan. The study employed the EBA method to examine the sensitivity and robustness of the explanatory variables of IPO underpricing. The study found that IPOs have been underpriced from the first to thirtieth-trading day indicating that Pakistani IPOs outperformed over the sample period. The study also found that offer price has a significant but negative impact on IPO underpricing. Likewise, Wei and Marsidi (2019) assessed the effect of issue-specific characteristics and company's attributes on the existence of underpricing of IPOs listed in Malaysia Stock Exchange. The empirical study revealed that offer size, market capitalization and issue price have significant impact on IPO underpricing level whereas company age is not statistically significant towards the degree of IPO underpricing. Further, Islam *et al.* (2010) analyzed the levels of underpricing in IPOs and its determinants of the Chittagong

Stock Exchange (CSE). The study revealed that age of the firm, and size of the company is positively correlated to the degree of underpricing. The study also revealed that the industry type and offer size are negatively correlated to the degree of underpricing while the timing of offer is found to have no significant influence on the degree of underpricing of IPOs in the Chittagong Stock Exchange.

Iqbal and Mubarik (2019) investigated the short-term performance of 64 listed Initial Public Offerings (IPOs) in Pakistan's stock exchange. The study found that average IPOs are underpriced in Pakistan, and the degree of underpricing varied according to the number of trading days. The study also showed that on a listing day, underpricing is 45.6% and if the investor holds shares till the end of the 30th trading day, investors can earn abnormal returns of 51.48% respectively. Similarly, Salfida *et al.* (2014) examined the influence of underwriter reputation, auditor reputation, company size, and company age on underpricing IPO for companies listed in Indonesia stock exchange. The study stated that company size and company age have significant influence on underpricing of IPO with negative direction. The study also showed that underwriter's reputation and the reputation of the auditor has no significant impact on IPO underpricing. Likewise, Wijaya and Kufepaksi (2023) analyzed the influence of profitability, company size, company age, and underwriter's reputation on the underpricing of stocks. The study found that profitability has no impact on underpricing. The study also revealed that firm age has no significant impact on underpricing. Further, Komariah *et al.* (2020) examined the factors affecting initial return in companies that conduct Initial Public Offering (IPO) on Indonesia Stock Exchange. The study used library technique and documentation technique by tracing historical data. The study analyzed the data by using cross sections with multiple regression models. The empirical study revealed that leverage has no impact on initial returns. Furthermore, the company size has a negative impact on initial return

Suresha *et al.* (2023) examined the determinants of Book Built IPOs underpricing. The study considered a sample of 180 Book Built IPOs that went public in India between 2011 and 2020. The study revealed that firm size, cash flows, subscription rate of QIBs and RIIs have a statistically significant influence on the listing day absolute return and the underpricing. In addition, the study also found a direct relationship between issue size and underpricing. Similarly, Miswanto and Abdullah (2020) assessed the impact of firm size, profitability, and capital structure on underpricing in firms conducting IPOs. The study found that firm size and return on assets have a significant but negative impact on underpricing. The study also found that profitability as represented by earning per share has a negative impact on underpricing. Likewise, Irawan (2024) investigated the factors affecting underpricing of IPOs of manufacturing sectors on the Indonesian stock exchange. The study used multiple linear regression analysis as the method for data analysis. The study indicated that earning per share has a significant but negative impact on underpricing. The study also found that inflation rate has a significant and positive impact on underpricing. Likewise, the study concluded that return on assets and deposit to assets ratio have no impact on underpricing of IPO's.

The market where the IPO takes place is known as the primary market. Thus the primary market plays important role in the development of the economy in every country. IPOs are sold at a significant discount, a phenomenon known as underpricing, from the prices that prevail in the aftermarket that results into significantly better performance of IPOs than that of equity market in general (Chi and Padgett, 2005). Dawson (1987) found that reputation of the underwriter and subscription rate do not have significant effect in the level of initial return. However, Li *et al.* (2008) examined the long-run performance of initial public offerings: The evidence for Switzerland. The study showed that a long-run underperformance to the fact that IPO firms tend to be small firms. According to Welch (1989), the deeper the underpricing, the higher will be the initial returns resulting into the better performance of IPOs for the investors. On the other hand, the deeper the underpricing, the lesser will be the net proceeds for the issuing companies resulting into the loss of wealth of the company as it represents

the part of the cost of going public for the companies. Likewise, Chalk and Peavy (1987) also reported average excess return of 21.65 percent and 9.87 percent respectively for the US capital market. For long run performance, in the U.S. empirical evidence showed that in the long run IPOs is underperformance relative to the overall market.

In the context of Nepal, Pradhan *et al.* (2016) examined the performance of the initial public offering (IPO) in the Nepalese Stock Market. The study found that firm size, reputation of issue manager, subscription rate, and market condition have positive impact on initial return. The study also found that there is a negative relationship between issue size and initial return. Similarly, Subedi and Dangal (2022) investigated the short run return of initial public offerings in Nepal. The study revealed that IPOs are underpriced to the extent of 3003 percent at the offer price. In addition, the study also revealed that issue size, firm size and age of the firm do not explain the IPO returns in the context of Nepalese primary market. Likewise, Paudel (2023) assessed the short run performance of initial public offerings in Nepal. The study showed that age of the firm has a significant impact on the level of IPO returns.

The above discussion shows that empirical evidences vary greatly across the studies on the factors affecting IPO underpricing. 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 factors affecting IPO underpricing in Nepal. Specifically, it examines the relationship of issue price, issue size, age of the firm, firm size, and earning per share with IPO underpricing in Nepal.

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

2. Methodological aspects

The study is based on the primary data. The data were gathered from 105 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on issue price, issue size, age of the firm, firm size, earning per share, raw initial return, and market adjusted initial return. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that IPO underpricing depends on issue price, issue size, age of the firm, firm size, and earning per share. Therefore, the model takes the following form:

$$RIR = \beta_0 + \beta_1 IP + \beta_2 IS + \beta_3 AF + \beta_4 FS + \beta_5 EPS + e$$

$$MAIR = \beta_0 + \beta_1 IP + \beta_2 IS + \beta_3 AF + \beta_4 FS + \beta_5 EPS + e$$

Where,

RIR = Raw initial return

MAIR = Market adjusted initial return

IP = Issue price of IPO

IS = Issue size of IPO

AF = Age of firm as measured by number of year of establishment during IPO issue, in years.

FS = Firm size

EPS = Earnings per share

Raw initial return 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 “IPOs often experience high raw initial returns on the first day of trading”, “The raw initial return is a reliable measure of IPO underpricing” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.815$).

Market adjusted initial return 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 “Market-adjusted initial returns provide a more accurate measure of IPO underpricing than raw returns”, “High market-adjusted initial returns suggest that an IPO is significantly underpriced relative to market conditions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.853$).

Issue price 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 “The higher the issue price, the lower the short-term returns on IPOs”, “The final offer price has a significant impact on the level of IPO underpricing” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.780$).

Issue size 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 “Larger issue sizes lead to a lower degree of IPO underpricing”, “The size of the issue has a significant effect on the IPO’s initial return” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.788$).

Age of firm 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 “Older firms experience lower IPO underpricing”, “The longevity of a company is a key factor in reducing IPO underpricing” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Firm size 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 “The size of a firm positively influences investor confidence, reducing underpricing”, “Bigger firms provide more information, leading to lower IPO underpricing” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.886$).

Earnings per share 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 “Higher EPS leads to lower IPO underpricing”, “The profitability indicated by EPS reduces the degree of IPO underpricing” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.861$).

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

Issue price

Issue price is the final offer price offered by the company determined after book building

process or fixed price process to the public for subscription of the Initial Public Offer (IPO). Higher issue prices may reflect strong investor demand and confidence in the company's prospects. Companies and underwriters might set higher prices knowing that the market will support it, and this demand can push the first-day trading prices even higher, resulting in underpricing. According to Srilakshmi and Archana (2016), offer price positively and significantly influence the listing performance of IPOs. Likewise, Wei and Marsidi (2019) found that issue price has a significant relationship with IPO underpricing level. Furthermore, Dias *et al.* (2023) found that issue price has a significant positive relationship with initial IPO return. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between issue price and IPO underpricing.

Issue size

Offer/Issue size is the amount of shares multiplied by the number of shares issued. It is also referred to as gross proceeds (Harvey, 2019). Larger issue sizes might attract more attention from investors, leading to higher demand for the shares. This increased demand can drive up the price of the shares on the first day of trading, resulting in underpricing. According to Ranjan and Madhusoodanan (2004), size has a significant but negative impact on IPO underpricing. In contrast, Yazdani and Aris (2015) concluded that there is a positive relationship between issue size and IPO underpricing. Likewise, Kavalenka (2018) stated that there is a significant impact of issue size on IPO underpricing. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between issue size and IPO underpricing.

Age of the firm

Older firms may have more historical financial data and operating history, leading to lower levels of information asymmetry between insiders and outside investors. However, the longer history of operations could also mean more uncertainty or complexity, potentially leading to greater information asymmetry and higher underpricing. Ariyanto *et al.* (2020) found that company age does not have an impact on the level of underpricing of shares. Similarly, Manu and Saini (2020) stated that age of firm has an insignificant relationship with underpricing. Older firms may use the IPO as an opportunity to signal their quality and stability to the market. However, signaling can sometimes lead to overvaluation, resulting in higher levels of underpricing. Likewise, Ekadjaja *et al.* (2023) revealed that company age has a positive impact on underpriced initial shares. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between age of the firm and IPO underpricing.

Firm size

Larger firms may have more information available to the public, resulting in lower levels of information asymmetry between the company's insiders and outside investors. Reduced information asymmetry can lead to more accurate pricing of the IPO shares, resulting in lower underpricing. Komariah *et al.* (2020) stated that company size has a negative relationship with underpricing. Similarly, Mahardika and Ismiyanti (2021) found that firm size has a negative impact on underpricing. Larger firms may benefit from economies of scale, allowing them to have more efficient operations and lower costs. These cost efficiencies and operational advantages can translate into higher profitability and lower underpricing when the company goes public. Likewise, Abbas *et al.* (2022) found that firm size has a significant negative impact on initial underpricing. Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between firm size and IPO underpricing.

Earning per share

Companies with higher EPS may have more transparent financial reporting and lower levels of information asymmetry between insiders and outside investors. Reduced information asymmetry can contribute to more accurate valuation and pricing of the IPO shares, leading to lower underpricing. Adiputra *et al.* (2023) showed that earning per share has a significant negative impact on stock underpricing. Similarly, Dwiningsih *et al.* (2024) found that there is no impact of earning per share on the stock performance of companies. Companies with higher EPS generally have a track record of strong financial performance and profitability. Investors may perceive these companies as less risky and more valuable, leading to more accurate pricing of the IPO shares and lower levels of underpricing. Likewise, Hanifitrianto *et al.* (2024) concluded that earning per share has a negative and significant influence on underpricing. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between earning per share and IPO underpricing.

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 variable and independent variables. The correlation coefficients are based on 105 observations. The dependent variables are RIR (Raw initial return) and MAIR (Market adjusted initial return). The independent variables are IP (Issue price of IPO), IS (Issue size of IPO), AF (Age of firm), FS (Firm size), and EPS (Earning per share).

Variables	Mean	S.D.	RIR	MAIR	IP	IS	AF	FS	EPS
RIR	3.411	0.778	1						
MAIR	3.505	0.749	0.590**	1					
IP	3.558	0.710	0.451**	0.510**	1				
IS	3.442	0.736	0.552**	0.545**	0.552**	1			
AF	3.491	0.773	0.543**	0.522**	0.495**	0.635**	1		
FS	3.413	0.855	0.532**	0.540**	0.501**	0.535**	0.677**	1	
EPS	3.408	0.810	0.562**	0.548**	0.460**	0.587**	0.650**	0.650**	1

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

Table 1 shows that issue price has a positive relationship with raw initial return. It indicates that higher the issue price of IPO, higher would be the raw initial return. Similarly, issue size has a positive relationship with raw initial return. It indicates that bigger the issue size, bigger would be the raw initial return. Likewise, age of the firm has a positive relationship with raw initial return. It indicates that older firms would yield higher raw initial return. Further, firm size has a positive relationship with raw initial return. It indicates that higher the size of the firm, higher would be the raw initial return. In addition, earning per share has a positive relationship with raw initial return. It indicates that higher earnings per share of IPO issuing company, higher would be the raw initial return.

Similarly, issue price has a positive relationship with market adjusted initial return. It indicates that higher the issue price, higher would be the market adjusted initial return. Similarly, issue size has

a positive relationship with market adjusted initial return. It indicates that higher the issue size of IPO offerings, higher would be the market adjusted initial return. Likewise, age of the firm has a positive relationship with market adjusted initial return. It indicates that higher the age of the firms, higher would be the market adjusted initial return. Further, firm size has a positive relationship with market adjusted initial return. It indicates that higher the firm size, higher would be the market adjusted initial return. In addition, earning per share has a positive relationship with market adjusted initial return. It indicates that higher the earning per share, higher would be the market adjusted initial return.

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 issue price, issue size, age of the firm, firm size, and earning per share on raw initial return.

Table 2

Estimated regression results of issue price, issue size, age of the firm, firm size and earning per share on raw initial return

The results are based on 105 observations using linear regression model. The model is $RIR = \beta_0 + \beta_1 IP + \beta_2 IS + \beta_3 AF + \beta_4 FS + \beta_5 EPS + e$ where the dependent variables is RIR (Raw initial return). The independent variables are IP (Issue price of IPO), IS (Issue size of IPO), AF (Age of firm), FS (Firm size), and EPS (Earning per share).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		IP	IS	AF	FS	EPS			
1	0.924 (3.059)**	0.699 (8.391)**					0.400	0.603	70.409
2	0.942 (3.493)**		0.717 (9.363)**				0.455	0.575	87.661
3	1.103 (4.118)**			0.661 (8.827)**			0.425	0.590	77.914
4	1.230 (5.472)**				0.639 (10.001)**		0.488	0.557	100.012
5	1.064 (4.596)**					0.689 (10.420)**	0.508	0.546	108.580
6	0.506 (1.749)	0.351 (3.317)**	0.481 (4.716)**				0.503	0.549	53.587
7	0.365 (1.276)	0.286 (2.704)**	0.309 (2.604)**	0.277 (2.660)**			0.531	0.533	40.212
8	0.386 (1.423)	0.190 (1.833)	0.302 (2.685)**	0.039 (0.329)*	0.343 (3.514)**		0.578	0.506	36.633
9	0.371 (1.396)	0.191 (1.877)	0.222 (1.931)	0.058 (0.465)	0.258 (2.514)**	0.270 (2.315)	0.596	0.495	31.655

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.
- Raw initial return is the dependent variable.

Table 2 shows that the beta coefficients for issue price are positive with raw initial return. It indicates that issue price has a positive impact on raw initial return. This finding is consistent with the findings of Archana and Srilaskhmi (2019). Similarly, the beta coefficients for issue size are positive with raw initial return. It indicates that issue size has a positive impact on raw initial return. This finding is consistent with the findings of Yazdani and Aris (2015). Likewise, the beta coefficients for age of the firm are positive with raw initial return. It indicates that age of the firm has a positive impact on raw initial return. This finding is consistent with the findings of Ekadjaja *et al.* (2023). In addition, the beta coefficients for firm size are positive with raw initial return. It indicates that firm size has a positive impact on raw initial return. This finding is consistent with the findings of Komariah *et al.* (2020). Furthermore, the beta coefficients for earning per share are positive with raw initial return. It indicates

that earning per share has a positive impact on raw initial return. This finding is not consistent with the findings of Dwiningsih *et al.* (2024).

Table 3 shows the regression results of issue price, issue size, age of the firm, firm size, and earning per share on market adjusted initial return.

Table 3

Estimated regression results of issue price, issue size, age of the firm, firm size, and earning per share on market adjusted initial return

The results are based on 105 observations using linear regression model. The model is $MAIR = \beta_0 + \beta_1 IP + \beta_2 IS + \beta_3 AF + \beta_4 FS + \beta_5 EPS + e$ where the dependent variables is MAIR (Market adjusted initial return). The independent variables are IP (Issue price of IPO), IS (Issue size of IPO), AF (Age of firm), FS (Firm size), and EPS (Earning per share).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		IP	IS	AF	FS	EPS			
1	1.115 (3.828)**	0.672 (8.366)**					0.399	0.581	69.990
2	1.112 (4.330)**		0.692 (9.406)**				0.457	0.552	88.479
3	1.373 (5.170)**			0.611 (8.225)**			0.391	0.585	67.652
4	1.505 (6.660)**				0.586 (9.118)**		0.441	0.560	83.138
5	1.389 (5.863)**					0.621 (9.177)**	0.444	0.559	84.216
6	0.707 (2.544)**	0.333 (3.273)**	0.468 (4.771)**				0.504	0.528	53.767
7	0.604 (2.165)*	0.285 (2.766)**	0.341 (2.951)**	0.204 (2.005)*			0.581	0.520	38.247
8	0.621 (2.313)*	0.205 (1.991)*	0.336 (3.012)**	0.004 (0.032)	0.289 (2.984)**		0.553	0.501	33.157
9	0.612 (2.290)*	0.205 (2.004)*	0.286 (2.461)*	0.058 (0.459)	0.235 (2.277)*	0.170 (1.448)*	0.558	0.498	27.235

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 adjusted initial return is the dependent variable.

Table 3 shows that the beta coefficients for issue price are positive with market adjusted initial return. It indicates that issue price has a positive impact on market adjusted initial return. This finding is consistent with the findings of Wei and Marsidi (2019). Similarly, the beta coefficients for issue size are positive with market adjusted initial return. It indicates that issue size has a positive impact on market adjusted initial return. This finding is consistent with the findings of Kavalenka (2018). Likewise, the beta coefficients for age of the firm are positive with market adjusted initial return. It indicates that age of the firm has a positive impact on market adjusted initial return. This finding is consistent with the findings of Ariyanto *et al.* (2020). In addition, the beta coefficients for firm size are positive with market adjusted initial return. It indicates that firm size has a positive impact on market adjusted initial return. This finding is consistent with the findings of Mahardika and Ismiyanti (2021). Furthermore, the beta coefficients for earning per share are positive with market adjusted initial return. It indicates that earning per share has a positive impact on market adjusted initial return. This finding is not consistent with the findings of Hanifitrianto *et al.* (2024).

4. Summary and conclusion

Initial Public Offering (IPO) is one of the most important financial decisions which attract many researchers to focus on reasons and different aspects of going public. Underpricing becomes a global phenomenon in the capital market when companies' conduct IPOs and companies planning

to go public should strategically set their issue price to reflect market value and growth potential, while optimizing the size of their offering to balance capital raising. Older firms can instill investor confidence. Strong financial performance, particularly in earning per share, should be highlighted to showcase potential and drive investor interest, leading to a successful IPO.

This study attempts to examine the factors affecting IPO underpricing in Nepal. The study is based on primary data of 105 observations.

The major conclusion of the study is that several factors including issue price, issue size, age of the firm, firm size, and earning per share exhibit a positive relationship with both raw initial returns and market-adjusted initial returns of IPO. This indicates that higher values in each of these variables are associated with higher initial returns, both in absolute terms and when adjusted for market performance. Specifically, the study finds that higher issue prices contribute positively to the initial returns of IPOs, as evidenced by the positive beta coefficients. Similarly, larger issue sizes are linked to higher initial returns, underscoring the significance of the scale of the offering in determining its initial market performance. The age of the firm also plays a crucial role, with older firms tending to achieve higher initial returns, which may reflect investor confidence in more established companies. Moreover, the size of the firm is positively correlated with initial returns, suggesting that larger firms are likely to experience better initial market performance due to their perceived stability and lower risk. Additionally, higher earning per share are positively correlated with both raw and market-adjusted initial returns, demonstrating that firms with stronger earning potential are rewarded with better initial performance in the market. Likewise, the study also concluded that issue size followed by issue price is the most influencing factor that explains the changes in the raw initial return and market adjusted initial return in the context of Nepalese share market.

References

- Abbas, D. S., A. Rauf, I. Hidayat, and D. Sasmita, 2022. Determinant on underpricing at the initial public offering: Evidence Indonesia Stock Exchange. *Quantitative Economics and Management Studies* 3(2), 175-185.
- Adiputra, A. K., P. E. E. Christmawan, and A. C. A. Tlonaen, 2023. Analysis of the effect of financial ratios on stock underpricing in initial public offerings on the Indonesia Stock Exchange. *Jurnal Ekonomi* 12(04), 2072-2080.
- Alli, K. L., V. Subrahmanyam, and G. KC, 2010. Short and long-run performance of initial public offerings in post-apartheid South Africa. *Journal of African Business* 11(1), 1-25.
- Ariyanto, A., S. Hasnawati, and E. Hendrawaty, 2020. Analysis of factors which affect company shares underpricing level at Initial public offering (IPO) on the Indonesia Stock Exchange Period 2013-2018. *International Journal of Economics and Management Studies* 7(8), 73-76.
- Aussenegg, W., 2001. Privatization versus private sector initial public offerings in Poland. *Multinational Finance Journal* 4(2), 69-99.
- Booth, R. A., 2007. Going public, selling stock, and buying liquidity. *Entrepreneurial Bus.* 2(1), 1-26.
- Bukh, P. N., C. Nielsen, P. Gormsen, and J. Mouritsen, 2005. Disclosure of information on intellectual capital in Danish IPO prospectuses. *Accounting, Auditing and Accountability Journal* 18(6), 713-732.
- Chalk, A. J., and W. Peavy, 1987. Initial public offerings: Daily returns, offering types and the price effect. *Financial Analysts Journal* 43(5), 65-69.
- Chi, J., and C. Padgett, 2005. Short-run underpricing and its characteristics in Chinese initial public offering (IPO) markets. *Research in International Business and Finance* 19(1), 71-93.
- Cucculelli, M., M. Geranio, C. Mazzoli, and S. Severini, 2021. IPO Pricing and Dealers' Interaction: A Stochastic

- Frontier Approach. *International Business Research*, 14(1), 1-12.
- Dawson, M. S., 1987. Secondary stock market performance of initial public offers, Hong Kong, Singapore and Malaysia: 1978-1984. *Journal of Business Finance and Accounting* 14(1), 65-76.
- Dias, D. S. M., M. R. P. Wijesinghe, and P. W. G. Madhushani, 2023. Factors affecting the initial return of Initial Public Offerings (IPOs) and IPO underpricing in the Colombo Stock Exchange. *Kelaniya Journal of Management* 12(1), 63-75.
- Dwiningsih, S., I. I. Ratnasari, and T. Rahmawati, 2024. Analysis of the factors affecting the performance of company shares on the Indonesian Stock Exchange. *Journal of Education, Science and Technology* 2(1), 17-26.
- Ekadjaja, M., R. Rorlen, and H. P. Siswanto, 2023. Determinants of underpriced initial stock: a study on the Indonesia stock exchange. *International Journal of Application on Economics and Business* 1(4), 2064-2074.
- Hanifitrianto, D. R., I. Rokhayati, and S. Muntahanah (2023). Analysis of factors that influence underpricing of shares in initial public offerings. *Journal of Accounting and Business* 2(1), 162-174.
- Husson, B., and B. Jacquillat, 1990. Sous-évaluation des Titres et Methodes d'introduction au Second Marche (1983-1986). *Revue Finance* 11(2), 123-134.
- Ibbotson, R. G., 1975. Price performance of common stock new issues. *Journal of Financial Economics* 2(1), 235-272.
- Iqbal, M., and F. Mubarik, 2019. Analysis of the determinants of the initial public offering valuation: Evidence from Pakistan's Stock Exchange. *International Journal of Business and Management* 14(2), 61-73.
- Irawan, I., 2024. Identification of underpricing factors initial public offering manufacturing sector on the Indonesia Stock Exchange. *International Journal of Indonesian Business Review* 3(1), 23-33.
- Islam, M., R. Ali, and Z. Ahmad, 2010. An empirical investigation into the underpricing of initial public offerings in the Chittagong Stock Exchange. *International Journal of Economics and Finance* 2(1), 36.
- Jelic, R., and R. Briston, 2003. Privatization initial public offerings: The polish experience. *European Financial Management* 9(4), 457-484.
- Jenkinson, T., and C. Mayer, 1988. The privatization process in France and the UK. *Eur. Econ. Rev.* 32(2-3), 482-490.
- Katti, S., and B. V. Phani, 2016. Underpricing of initial public offerings: A literature review. *Universal Journal of Accounting and Finance* 4(2), 35-52.
- Kavalenka, Y., 2018. Determinants of IPO underpricing on the Warsaw Stock Exchange. *Finanse, Rynki Finansowe, Ubezpieczenia*, 9(1), 257-267.
- Komariah, S., R. Ariyanti, W. N. Ibrahim, A. Pujilestari, and M. H. Zaki, 2020. Factors affecting initial return in companies that conduct Initial Public Offering (IPO) on Indonesia Stock Exchange. *Solid State Technology* 63(4), 1-10.
- Kunz, R. M., and R. Aggarwal, 1994. Why initial public offerings are underpriced: Evidence from Switzerland. *Journal of Banking and Finance* 18(4), 705-723.
- Li, W., M. Fowler, and J. Naughton, 2008. Long-run performance of initial public offerings: The evidence for Switzerland. *Schmalenbach Business Review* 57(3), 253-275.
- Mahardika, D. F., and F. Ismiyanti, 2021. The effect of financial and non-financial variables on underpricing. *European Journal of Economic and Financial Research* 4(4), 65-81.
- Manu, K. S., and C. Saini, 2020. Valuation analysis of initial public offer (IPO): The case of India. *Paradigm*

24(1), 7-21.

- Menyah, K., K. Paudyal, C. Inganyete, 1995. Subscriber return, underpricing, and long-term performance of UK privatization initial public offers. *J. Econ. Bu* 47(5), 473-495.
- Miswanto, M., and Y. R. Abdullah, 2020. Analysis of the effect of firm size, profitability and capital structure on IPO underpricing on the Indonesia Stock Exchange (IDX). *International Journal of Innovation, Creativity and Change* 13(10), 829-844.
- Mumtaz, M. Z., and A. M. Ahmed, 2014. Determinants of underpricing of initial public offerings: Evidence from Pakistan. *Journal of Business and Economics* 6(1), 47-80.
- Myers, S., and R. Brealey, 2003. "Principles of Corporate Finance (7th Edition)", London: Prentice Hall.
- Paudel, S. R., 2023. Short run performance of initial public offerings in Nepal. *Journal of Nepalese Management Academia* 1(1), 63-72.
- Pradhan, P., R., Shyam, and K. Shrestha, 2016. Performance of the initial public offering (IPO) in the Nepalese Stock Market. *Nepalese Journal of Business* 3(3), 1-9.
- Salfida, R., K. Dewi, and M. Mukhtaruddin, 2014. The influence of underwriter reputation, auditor reputation, company size, and company age on underpricing IPO for companies listed in Indonesia Stock Exchange Period 2008-2013. *Akuntabilitas* 8(2), 209-222.
- Srilakshmi, D., and H. N. Archana, 2021. An empirical investigation on the underpricing of initial public offerings—evidence from Indian capital markets. *PIMT Journal of Research* 13(3), 117-121.
- Su, D. W., and B. Fleisher, 1999. An empirical investigation of underpricing in Chinese IPOs. *Pacific-Basin Finance Journal* 7(3), 173-202.
- Subedi, P. P., and S. Dangal, 2022. The short run return of initial public offerings in Nepal. *SEBON Journal* 9(6), 1-15.
- Suresha, B., S., Nayak, T. A. Krishna, and R. Thomas, 2023. Determinants of Book Built IPO underpricing-Differential issue size and market momentum approach revisited. *Cogent Economics and Finance* 11(2), 1-18.
- Syapril, Y., D. Wahyuni, and S. W. Bakar, 2019. Informasi Keuangan Dan Non Keuangan Terhadap Underpricing Pada Saat Initial Public Offering. *Ekspektra: Jurnal Bisnis dan Manajemen* 3(1), 39-51.
- Wei, F. J., and A. B. Marsidi, 2019. Determinants of Initial Public Offering (IPO) Underpricing in Malaysian Stock Market. *International Journal of Academic Research in Business and Social Sciences* 9(11), 1183-1199.
- Welch, I., 1989. Seasoned offerings, imitation costs and the underpricing of initial public offerings. *Journal of Finance* 44(1), 421-449.
- Wijaya, A. A., and M. Kufepaksi, 2023. Analysis of the influence of profitability, company size, company age, and underwriter's reputation on the underpricing of stocks during the IPO on IDX 2010-2020 period. *Asian Journal of Economics and Business Management* 2(1), 438-445.
- Wijayanto, A., 2010. Analisis pengaruh ROA, EPS, financial leverage, proceed terhadap initial return. *Jurnal Dinamika Manajemen* 1(1), 68-78.
- Yazdani, L., and S. Aris, 2015. An assessment of the performance of initial public offering (IPOs) in Malaysia. *Research Journal of Finance and Accounting* 6(3), 1-5.

Chapter 18

Impact of Brand Image on Consumer Satisfaction and Loyalty: A Case of Kathmandu Valley

Jamuna Giri*

Abstract

The study examines the impact of brand image on consumer satisfaction and loyalty in the context of Kathmandu Valley. Consumer satisfaction and consumer loyalty are selected as the dependent variables. The selected independent variables are brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association. The study is based on primary data with 122 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 brand image on consumer satisfaction and loyalty of various brands in the context of Kathmandu Valley.

The study showed that brand personality has a positive impact on consumer satisfaction and consumer loyalty. It implies that a stronger or more favorable brand personality tends to enhance consumer satisfaction and foster greater consumer loyalty. Moreover, brand trust has a positive impact on consumer satisfaction and consumer loyalty. It means that greater trust in a brand lead to higher consumer satisfaction and increased consumer loyalty. Likewise, perceived quality has a positive impact on consumer satisfaction and consumer loyalty, indicating that higher perceived quality leads to an increase in consumer satisfaction and consumer loyalty. Moreover, value proposition has a positive impact on consumer satisfaction and consumer loyalty. It means that a stronger value leads to an increase in consumer satisfaction and consumer loyalty. Furthermore, brand awareness has a positive impact on consumer satisfaction and consumer loyalty. It implies that higher brand awareness leads to an increase in consumer satisfaction and consumer loyalty. Likewise, brand association has a positive impact on consumer satisfaction and consumer loyalty. Indicating that stronger brand association leads to an increase in consumer satisfaction and consumer loyalty.

Keywords: brand personality, brand trust, perceived quality, value proposition, brand awareness, brand association

1. Introduction

In the realm of marketing, brand image stands as a cornerstone influencing how consumers perceive and interact with various brands. The essence of brand image lies in its ability to shape perceptions through accumulated consumer experiences and the symbolic value brands hold. This intrinsic value of brand image has a profound impact on customer satisfaction and loyalty. It is an essential metric that signify a brand's health and its future prospects in competitive market. Brand image is fundamentally the perception held by consumers about a particular brand's values and qualities as reflected in its products, communications, and consumer experiences. Brand image, customer satisfaction and consumer loyalty are considered as very powerful weapons in the field of marketing. These constraints are used as a marketing benchmark for the company outcome and performance (Bennett and Rundle-Thiele, 2004). Kotler and Keller (2016) suggested that a positive brand image enhances consumer satisfaction because it aligns with the consumers' expectations and self-image. When consumers see a brand as a reflection of their own values and status, they are more likely to continue using the brand, contributing to higher levels of loyalty.

* Ms. Giri is a Freelance Researcher, Kathmandu, Nepal.

Every organization and business want to be successful and have desire to achieve long lasting progress. Brand image is the most important asset for any organization and it is the resource of achieving competitive advantage. Consumer loyalty, on the other hand, emerges when customers develop a strong preference for a brand and consistently repurchase its products or services over time, often resisting the allure of competitors (Dick and Basu, 1994). Customer satisfaction is the degree to which a product's and service's benefits are perceived in accordance with the consumer's expectations. Upamannu *et al.* (2006) assessed the impact of brand trust on customer loyalty of FMCG sector at Gwalior region. The results revealed that the brand trust has a significant positive impact on customer loyalty. Saeed *et al.* (2013) analyzed the effect of brand image on brand loyalty and role of customer satisfaction on it. The finding revealed a positive and significant relation between brand image and brand loyalty and customer satisfaction. Bayraktar (2015) assessed the effect of brand associations on consumer's willingness to pay a premium price. The study showed that brand associations significantly and positively influence the consumer's willingness to pay. Lahap *et al.* (2016) examined the brand image towards customer's satisfaction in the Malaysian Hotel Industry. The finding revealed that brand image does influence customer satisfaction in the Malaysian hotel industry context. Mehta and Tariq (2020) assessed how brand image and perceived service quality affect customer loyalty through customer satisfaction. The study showed that customer satisfaction plays a mediating role between brand image, perceived service quality and customer loyalty. If the customers are satisfied to the brand image and perceived service quality then the loyalty of customers also increase. Putranto *et al.* (2022) investigated the effect of brand image and brand awareness on loyalty with customer satisfaction as intervening variables. The result showed that brand awareness has a positive and significant effect on the customer satisfaction.

A well-maintained brand image assures consumers of consistent quality and reliability, leading to higher satisfaction levels. Brands with a strong, positive image often create an emotional connection with consumers. This emotional bond can lead to greater satisfaction as customers feel more valued and appreciated. Ramadhani *et al.* (2024) examined the effect of service quality, image, and brand trust on buying interest in Shopee E-Commerce. The results of this study indicated that the e-service quality and brand image partially have a significant effect on purchase intention while the brand trust partially has no significant effect on purchase intention. Simultaneously, e-service quality, brand image and brand trust have a significant effect on purchase intention. Hardiansyah and Akbar (2024) assessed the impact of brand image and customer satisfaction on Indomaret customer loyalty in Sumbawa city. The results indicated that the brand image and customer satisfaction have a partially positive and considerable impact on the loyalty of Indomaret customers in Sumbawa City. Patoding and Muzammil (2023) analyzed the influence of brand awareness, perceived quality, brand association and brand loyalty on purchase intention towards Bear brand's consumers. The results showed that brand awareness, brand associations, and brand loyalty have a positive and significant effect on purchase intention. Meanwhile, perceived quality has no significant effect on purchase intention. Jasin *et al.* (2023) examined the effects of customer satisfaction, perceived service quality, perceived value, and brand image on customer loyalty. The results showed that satisfaction has a positive and significant effect on consumer loyalty.

A positive brand image often implies high quality, which enhances consumer satisfaction. Customers tend to trust brands with a strong, positive image and believe their products or services will meet their expectations. Lues (2024) assessed the determinants impacting fashion brand loyalty among Generation Y students in South Africa. The results showed that perceived quality leads to brand loyalty, brand awareness, brand association and simultaneously impacts brand loyalty. In the context of perceived quality, the consumer will evaluate the product's perceived quality. Perceive quality can give subjective judgment to a consumer's mind. The good quality of the product will increase brand loyalty

product. Ardansyah and Seprianty (2024) examined the impact of brand trust on customer satisfaction and customer loyalty. The results of this study indicated that the existence of a brand trust have significant effect on customer loyalty. Moreover, customer satisfaction mediates the relationship between brand trust and customer loyalty, while customer satisfaction does not affect customer loyalty. Mehta and Tariq (2020) assessed how brand image and perceived service quality affect customer loyalty through customer satisfaction. The study showed that customer satisfaction plays a mediating role between brand image, perceived service quality and customer loyalty. Because if the customers are satisfied to the brand image and perceived service quality then the loyalty of customers also increase. In modern competitive environment, organizations create good brand image in the mind of the customers and also try to provide good quality service to maintain their good reputation in the mind of the customers of supermarket. Azizan and Yusr (2019) assessed the influence of customer satisfaction, brand trust, and brand image towards customer loyalty. The results showed that customer satisfaction, brand trust, and brand image have a positive and significant influence on customer loyalty. Upamannyu and Sankpal (2014) examined the effect of brand image on customer satisfaction and loyalty intention and the role of customer satisfaction between brand image and loyalty intention. The results revealed that there is a strong positive relationship between brand image and loyalty intention.

In the context of Nepal, Neupane and Devkota (2017) examined the impacts of service quality dimensions on patient/customer satisfaction of private hospitals in Nepal. The results showed that each dimension of service quality is positively correlated to patient satisfaction, and overall service quality. Laohakosol and Sharma (2018) examined the impact of product-related and social factors on purchase intention of smart-phone buyers in Nepal. The results showed that among the considered independent variables, compatibility, social influence and product features would significantly influence the purchase intention of the smart-phone buyers. However, price, quality and country of origin had no significant relationship with the purchase intention. Rai *et al.* (2022) investigated the factors affecting smartphone purchase decisions of consumers. The result discovered that brand image, product attributes, and social factors significantly influence consumer purchasing behavior. Rai *et al.* (2023) examined factors affecting brand experience of passenger cars in Nepal. The result of the study showed that attributes, brand personality and self-congruity have significant positive impact on brand experience but price and appearance have no significant influence on brand experience for passenger cars in Nepal.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of brand image on consumer satisfaction and loyalty of various brands. 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 brand image on consumer satisfaction and loyalty of various brands in Kathmandu Valley. Specifically, it examines the relationship of brand personality, brand image, perceived quality, value proposition, brand awareness and brand association with consumer satisfaction and consumer loyalty 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 122 respondents through questionnaire. The study is based on convenience sampling method. The respondents' views were

collected on brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association, level of satisfaction and loyalty. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that the consumer satisfaction and consumer loyalty towards various brands depends upon various factors. The dependent variables selected for the study are consumer satisfaction and consumer loyalty. Similarly, the selected independent variables are brand personality, brand image, perceived quality, value proposition, brand awareness and brand association. Therefore, the models take the following forms.

$$CS = \beta_0 + \beta_1 BP + \beta_2 BT + \beta_3 PQ + \beta_4 VP + \beta_5 BA + \beta_6 BAS + \epsilon$$

$$CL = \beta_0 + \beta_1 BP + \beta_2 BT + \beta_3 PQ + \beta_4 VP + \beta_5 BA + \beta_6 BAS + \epsilon$$

Where,

CS = Consumer satisfaction

CL = Consumer loyalty

BP = Brand personality

BT = Brand trust

PQ = Perceived quality

VP = Value proposition

BA = Brand awareness

BAS = Brand association

Brand personality 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 brand displays characteristics that align well with my personal values”, “I perceive this brand as genuine and authentic” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.843$).

Brand trust 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 trust this brand provide reliable products and services”, “I trust this brand to fulfill its promises and commitments” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.862$).

Perceived quality 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 quality of this brand’s product and services is superior to other available in the market”, “I am rarely disappointed by the quality of brand’s product and services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.868$).

Value proposition 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 “This brand offers good value for the money I spend”, “Brand provides a good balance between cost and benefit” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.877$).

Brand awareness 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 very familiar with this brand.”, “This brand is top of mind when I think about product category” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.880$).

Brand association 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 associate this brand with positive attributes and benefits”, “Using this brand’s products/ services makes me feel proud or pleased” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.851$).

Consumer 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 are 5 items and sample items include “I am generally satisfied with my experience with this brand”, “My interactions with this brand are consistently positive” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.898$).

Consumer 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 likely to continue purchasing this brand in future”, “This brand is my first choice in its category” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.898$).

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

Brand personality

Brand personality plays a crucial role in influencing consumer satisfaction and loyalty. By establishing a distinct and relatable brand personality, businesses can create emotional connections, set clear expectations, and enhance the overall consumer experience. This, in turn, leads to higher satisfaction and stronger loyalty, contributing to long-term success and competitive advantage. Building and maintaining a consistent and authentic brand personality should be a strategic focus for businesses aiming to foster deeper consumer relationships and drive sustained growth. Brand personality is one of the most critical and consistent predictors of both behavioral brand loyalty and attitudinal brand loyalty (Anisimova, 2007). Anita (2019) examined that brand personality and customer satisfaction have a significant influence on customer loyalty to visit Botani Square Shopping Mall, Bogor City. Mabkhot *et al.* (2016) investigated the mediating effect of brand satisfaction on the relationship between brand personality and brand loyalty. The findings showed that brand personality and brand satisfaction have a positive and significant relationship with brand loyalty. Moreover, Ly (2017) concluded that brand experience and brand personality do play an indispensable role in the context of Vietnam’s fashion market, because of their significant impacts on customer satisfaction and customer loyalty. Based on it,

this study develops the following hypothesis:

H₁: There is a positive relationship of brand personality with consumer satisfaction and loyalty.

Brand trust

Brand trust is a foundational element that significantly impacts consumer satisfaction and loyalty. By fostering trust, brands can enhance consumer satisfaction, reduce perceived risks, and encourage repeat purchases and advocacy. The interplay between satisfaction and loyalty further underscores the importance of trust, as satisfied consumers who trust a brand are more likely to remain loyal and contribute to the brand's long-term success. Building and maintaining brand trust should be a strategic priority for businesses aiming to achieve sustained growth and competitive advantage (Chandio et al., 2015). Rudzewicz and Strychalska (2021) investigated the influence of brand trust on consumer loyalty. The study demonstrated that brand trust plays a vital role in consumer buying behavior and has a positive effect on consumer loyalty. Budi et al. (2021) assessed the effects of experience and brand relationship to brand satisfaction, trust and loyalty shopping distribution of consumer Philips's lighting product in Indonesia. The study showed that brand trust plays a pivotal role in shaping how consumers perceive and interact with a brand, ultimately influencing their satisfaction and loyalty. Trustworthy brands are more likely to provide positive consumer experiences. These positive experiences reinforce satisfaction as consumers feel their needs and expectations are understood and met. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship of brand trust with consumer satisfaction and loyalty.

Perceived quality

According to Daniel and Berinyuy (2010), service quality and customer satisfaction are very important concepts that companies must understand in order to remain competitive in business and hence grow. It is very important for companies to know how to measure these constructs from the consumer perspective in order to better understand their needs and hence satisfy them. Samudro et al. (2020) assessed the effects of perceived quality and perceived value on customer satisfaction. The results confirmed that perceived value and perceived quality contributes a stronger influence on customer satisfaction. Ha and Park (2012) investigated the effects of customer orientation, perceived quality and satisfaction on brand loyalty in China. Both perceived quality and customer satisfaction are positively associated with brand loyalty through customer orientation acting as a moderating variable. Marakanon and Panjakajornsak (2017) assessed perceived quality, perceived risk and customer trust affecting customer loyalty of environmentally friendly electronics products. The results showed that perceived risk and customer trust have a direct effect on customer loyalty while perceived quality had an indirect effect on customer loyalty through customer trust. Based on it, this study develops the following hypothesis:

H₃: There is positive relationship of perceived quality with consumer satisfaction and loyalty.

Value proposition

The value proposition is a critical element in driving consumer satisfaction and loyalty. By clearly communicating and consistently delivering unique benefits and value, businesses can enhance consumer perceptions, meet or exceed expectations, and build strong, long-lasting customer relationships. A compelling value proposition not only attracts new customers but also retains existing ones, contributing to sustained business success (Woratschek et al., 2020). Abidin et al. (2022) revealed that the customer

proposition value has a significant effect on customer loyalty and customer satisfaction. Yulistiana *et al.* (2021) assessed the influence of brand perceived quality, image product and place convenience on customer loyalty through unique value proposition. The study concluded that brand perceived quality is positive and has significant affect unique value preparation. Moreover, value proposition has a positive and significant effect on customer loyalty. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship of value proposition with consumer satisfaction and loyalty.

Brand awareness

Brand awareness plays an important role in all dimensions of brand equity. Kotler and Keller (2016) examined one of the fundamental dimensions of brand equity is brand awareness, often seen as prerequisite of peoples' buying decision. Poranki (2015) revealed that there is a positive impact of brand awareness on customer satisfaction with respect to product quality, price and size of the cigarettes etc. Bilgili and Ozkul (2015) examined the impact of brand awareness and customer experience on the brand loyalty. The study showed a significantly positive correlation among brand awareness, service experience, emotional experience and brand loyalty. The results showed that perceived quality leads to brand loyalty, brand awareness, brand association and simultaneously influence brand loyalty. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship of brand awareness with consumer satisfaction and loyalty.

Brand association

Phong *et al.* (2020) examined the relationship between brand association and customer loyalty. The results showed that brand association and brand awareness have positive effects on customer loyalty. Cyntya and Berlianto (2023) analyzed the effect of credible online review, brand equity dimension, and customer satisfaction towards Bio Beauty Lab's Repurchase Intention. The result showed that Brand awareness, perceived value, brand personality, brand associations, and perceived quality positively affect customer satisfaction. Romaniuk and Nenycz-Thiel (2013) investigated the behavioral brand loyalty and consumer brand associations. The results showed a positive relationship between behavioral brand loyalty and consumer brand associations. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship of brand association with consumer satisfaction and 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 coefficient matrix

This table presents Kendall's coefficients between dependent and independent variables. The correlation coefficients are based on 122 observations. The dependent variables are CS (Consumer satisfaction) and CL (Consumer loyalty). The independent variables are BP (Brand personality), BT (Brand trust), PQ (Perceived quality), VP (Value proposition) BA (Brand awareness) and BAS (Brand association).

Variables	Mean	S.D.	CS	CL	BP	BT	PQ	VP	BA	BAS
CS	3.818	0.908	1.000							
CL	3.780	0.935	0.674**	1.000						
BP	3.757	0.815	0.378**	0.410**	1.000					
BT	3.649	0.837	0.325**	0.360**	0.447**	1.000				
PQ	3.490	0.962	0.332**	0.374**	0.425**	0.398**	1.000			
VP	3.549	0.962	0.403**	0.377**	0.414**	0.348**	0.489**	1.000		
BA	3.515	0.982	0.453**	0.456**	0.448**	0.352**	0.423**	0.430**	1.000	
BAS	3.655	0.912	0.470**	0.505**	0.397**	0.326**	0.333**	0.458**	0.539**	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 for dependent and independent variables. The study shows that brand personality is positively correlated to consumer satisfaction. It indicates that a stronger or more favorable brand personality leads to increase in consumer satisfaction. Similarly, brand trust has a positive relationship with consumer satisfaction. It indicates that greater trust in a brand leads to higher consumer satisfaction. Moreover, perceived quality has a positive relationship with consumer satisfaction. It indicates that higher perceived quality tends to enhance consumer satisfaction. Further, value proposition is positively correlated to consumer satisfaction. It indicates that a stronger value proposition tends to enhance consumer satisfaction. In addition, brand awareness is positively correlated to consumer satisfaction. It indicates that that higher brand awareness leads to an increase in consumer satisfaction. In addition, brand association is positively correlated to consumer satisfaction. It indicates that stronger brand association leads to an increase in consumer satisfaction.

In addition, the study shows that brand personality is positively correlated to consumer loyalty. It indicates that a stronger or more favorable brand personality leads to increase in consumer loyalty. Similarly, brand trust has a positive relationship with consumer loyalty. It indicates that greater trust in a brand lead to higher consumer loyalty. Moreover, perceived quality has a positive relationship with consumer loyalty. It indicates that higher perceived quality tends to enhance consumer loyalty. Further, value proposition is positively correlated to consumer loyalty. It indicates that a stronger value proposition tends to enhance consumer loyalty. In addition, brand awareness is positively correlated to consumer loyalty. It indicates that that higher brand awareness leads to an increase in consumer loyalty. In addition, brand association is positively correlated to consumer loyalty. It indicates that stronger brand association leads to an increase in consumer loyalty.

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 and Table 3. More specifically, Table 2 shows the regression results of brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association on consumer satisfaction in Kathmandu Valley.

Table 2

Estimated regression results of brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association on consumer satisfaction in Kathmandu Valley

The results are based on 122 observations using linear regression model. The model is $CS = \beta_0 + \beta_1 BP + \beta_2 BT + \beta_3 PQ + \beta_4 VP + \beta_5 BA + \beta_6 BAS + \epsilon$ where the dependent variable is CS (Consumer satisfaction). The independent variables are BP

(Brand personality), BT (Brand trust), PQ (Perceived quality), VP (Value proposition) BA (Brand awareness) and BAS (Brand association).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		BP	BT	PQ	VP	BA	BAS			
1	7.685 (4.684)**	0.607 (7.113)**						0.291	3.825	50.595
2	10.028 (6.085)**		0.497 (5.641)**					0.203	4.055	31.822
3	11.717 (8.401)**			0.422 (5.481)**				0.194	4.078	30.046
4	11.794 (8.268)**				0.411 (5.298)**			0.183	4.106	28.066
5	9.491 (7.633)**					0.546 (8.013)**		0.343	3.681	64.20
6	8.008 (5.899)**						0.606 (8.411)**	0.366	3.617	70.74
7	6.311 (3.608)**	0.471 (4.419)**	0.215 (2.070)*					0.310	3.773	28.132
8	5.672 (3.231)**	0.394 (3.515)**	0.163 (1.546)	0.174 (2.027)*				0.327	3.725	20.614
9	5.034 (2.823)**	0.366 (3.260)**	0.153 (1.458)	0.094 (0.337)	0.154 (1.680)			0.337	3.697	16.405
10	4.588 (2.710)**	0.232 (2.064)**	0.136 (1.370)	0.019 (0.202)	0.087 (0.979)	0.329 (3.791)**		0.405	3.502	17.497
11	3.591 (2.165)**	0.195 (1.796)	0.060 (0.650)	0.060 (0.650)	0.066 (0.062)	0.190 (2.015)*	0.316 (3.201)**	0.449	3.370	17.451

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.
- Consumer satisfaction is the dependent variable.

The regression results show that the beta coefficients for brand personality are positive with consumer satisfaction. It indicates that brand personality has a positive impact on consumer satisfaction. This finding is consistent with the findings of Anita (2019). Similarly, the regression result shows that the beta coefficients for brand trust are positive with consumer satisfaction. It indicates that brand trust has a positive impact on consumer satisfaction. This finding is similar to the findings of Budi et al. (2021). Moreover, the beta coefficients for perceived quality are positive with consumer satisfaction. It indicates that perceived quality has a positive impact on consumer satisfaction. This finding is consistent with the findings of Samudro et al. (2020). In addition, the beta coefficients for value propositions are positive with consumer satisfaction. It indicates that value proposition has positive impact on consumer satisfaction. This finding is similar to the findings of Abidin *et al.* (2022). Similarly, the beta coefficients for brand awareness are positive with consumer satisfaction. It indicates that brand awareness has a positive impact on consumer satisfaction. This finding is consistent with the findings of Poranki (2015). In addition, the beta coefficient for brand association are positive with consumer satisfaction. Which indicates that brand association has a positive impact on consumer satisfaction. This finding is similar to the findings of Cyntya and Berlianto (2023).

Table 3 shows the regression results of brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association on consumer satisfaction in Kathmandu Valley.

Table 3

Estimated regression result of brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association on consumer loyalty in Kathmandu Valley

The results are based on 122 observations using linear regression model. The model is $CL = \beta_0 + \beta_1 BP + \beta_2 BT + \beta_3 PQ + \beta_4 VP + \beta_5 BA + \beta_6 BAS + \varepsilon$ where the dependent variable is CL (Consumer loyalty). The independent variables are BP (Brand personality), BT (Brand trust), PQ (Perceived quality), VP (Value proposition) BA (Brand awareness) and BAS (Brand association).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		BP	BT	PQ	VP	BA	BAS			
1	6.532 (3.957)**	0.658 (7.666)**						0.323	3.849	58.765
2	9.326 (5.532)**		0.525 (5.826)**					0.214	4.148	33.948
3	10.629 (7.576)**			0.474 (6.115)**				0.231	4.102	37.389
4	11.814 (7.938)**				0.399 (4.932)**			0.162	4.284	24.329
5	8.813 (6.956)**					0.574 (8.265)**		0.357	3.750	68.316
6	6.663 (4.989)**						0.670 (9.443)**	0.421	3.558	89.161
7	5.184 (2.943)**	0.525 (4.889)**	0.211 (2.016)*					0.340	3.801	32.164
8	4.388 (2.505)**	0.429 (3.833)**	0.146 (1.389)	0.217 (2.532)**				0.369	3.717	24.555
9	4.081 (2.273)**	0.415 (3.670)**	0.142 (1.339)	0.179 (1.817)	0.074 (0.802)			0.367	3.723	18.521
10	3.627 (2.130)*	0.278 (2.465)*	0.125 (1.244)	0.102 (1.074)	0.006 (0.063)	0.335 (3.838)**		0.433	3.522	19.501
11	2.272 (1.415)	0.228 (2.173)*	0.072 (0.771)	0.157 (1.769)	0.120 (0.123)	0.146 (1.598)	0.429 (4.495)**	0.514	3.262	22.310

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.
- Consumer loyalty is the dependent variable.

The regression results show that the beta coefficients for brand personality are positive with consumer loyalty. It indicates that brand personality has a positive impact on consumer loyalty. This finding is similar to the findings of Mabkhot *et al.* (2016). Similarly, the regression result shows that the beta coefficients for brand trust are positive with consumer loyalty. It indicates that brand trust has a positive impact on consumer loyalty. This finding is consistent with the findings of Rudzewicz and Strychalska (2021). Moreover, the beta coefficient for perceived quality are positive with consumer loyalty. It indicates that perceived quality has a positive impact on consumer loyalty. This finding is similar to the findings of Ha and Park (2012). In addition, the beta coefficients for value propositions are positive with consumer loyalty. It indicates that value proposition has positive impact on consumer loyalty. This finding is consistent with the findings of Yulistiana *et al.* (2021). Similarly, the beta coefficients for brand awareness are positive with consumer loyalty. It indicates that brand awareness has a positive impact on consumer loyalty. This finding is similar to the findings of Bilgili and Ozkul (2015). In addition, the beta coefficient for brand association are positive with consumer loyalty. It indicates that brand association has a positive impact on consumer loyalty. This finding is consistent with the findings of Phong *et al.* (2020).

4. Summary and conclusion

Brand image plays a critical role in shaping consumer satisfaction and loyalty. A strong brand image often leads to higher perceived quality of products or services. Consumers tend to associate well-known, positively viewed brands with superior quality, which enhances their satisfaction when they choose those brands. A strong brand image significantly impacts consumer satisfaction and loyalty. Companies that invest in building and maintaining a positive brand image are more likely to enjoy

higher levels of consumer satisfaction and loyalty, ultimately leading to sustained business success.

This study attempts to examine the impact of brand image on consumer satisfaction and loyalty in Kathmandu Valley. The study is based on primary data with 122 observations.

The major conclusion of the study is that brand personality, brand trust, perceived quality, value proposition, brand awareness and brand association have positive effect on consumer satisfaction and consumer loyalty of various brands in Kathmandu Valley. A strong, well-defined brand personality helps consumers relate to the brand on a personal level, enhancing their satisfaction and loyalty. High-quality perceptions significantly contribute to consumer satisfaction, which in turn drives loyalty. A strong value proposition, which effectively communicates the benefits and value that consumers can expect, helps differentiate a brand from its competitors. When consumers perceive that they are receiving good value for their money, their satisfaction and loyalty are significantly enhanced. High levels of brand awareness mean that a brand is easily recognizable and stays top-of-mind for consumers, which is essential for fostering loyalty. Positive brand associations, on the other hand, reinforce the brand's image and contribute to consumer satisfaction by aligning the brand with favorable qualities and experiences. The study also concluded that brand association has a most determining factor that explains the changes in the level of consumer satisfaction in Kathmandu Valley.

References

- Abidin, Z., T. Hidayati, and S. Suharno, 2022. Can the customer value proposition form customer loyalty? *J-MKLI (Jurnal Manajemen Dan Kearifan Lokal Indonesia)* 6(1), 15-25.
- Anisimova, A. T., 2007. The effects of corporate brand attributes on attitudinal and behavioural consumer loyalty. *Journal of Consumer Marketing* 24(7), 395-405.
- Anita, T. L., 2019. The effect of brand personality and customer satisfaction to customer loyalty at the mall: A study case. *International Journal of Tourism and Hospitality in Asia Pasific* 2(1), 1-7.
- Ardansyah, A., and S. Seprianty, 2024. The influence of promotion, service quality and trust on go food customer satisfaction in Bandar Lampung city. *International Journal of Economics, Business and Innovation Research* 3(3), 305-324.
- Azizan, N. S., and M. M. Yusr, 2019. The influence of customer satisfaction, brand trust, and brand image towards customer loyalty. *International Journal of Entrepreneurship and Management Practices* 2(7), 93-108.
- Bayraktar, A., 2015. Are consumers really willing to pay more for favorable brand associations? The moderating role of product value and product risk level. *Ege Academic Review* 15(4), 22-29.
- Bennett, R., and S. Rundle-Thiele, 2004. Customer satisfaction should not be the only goal. *Journal of Services Marketing* 18(7), 514-523.
- Bilgili, B., and E. Ozkul, 2015. Brand awareness, brand personality, brand loyalty and consumer satisfaction relations in brand positioning strategies (A Torku brand sample). *Journal of Global Strategic Management* 9(2), 10-20.
- Budi, S. C., Z. Hidayat, and L. Mani, 2021. The effects of experience and brand relationship to brand satisfaction, trust and loyalty shopping distribution of consumer Philips lighting product in Indonesia. *Journal of Distribution Science* 19(1), 115-124.
- Chandio, Z. U., M. A. Qureshi, and S. Ahmed, 2015. Brand trust, customer satisfaction and brand loyalty-A cross

- examination. *Journal of Business Strategies* 9(1), 62-70.
- Cyntya, C., and M. P. Berlianto, 2023. The effect of credible online review, brand equity dimension, and customer satisfaction towards bio beauty Lab's Repurchase Intention. *Journal Organisasi Dan Manajemen* 19(1), 203-223.
- Daniel, C. N., and L. P. Berinyuy, 2010. Using the SERVQUAL model to assess service quality and customer satisfaction. An empirical study of grocery stores in Umea. *Umea School of Business* 16(4) 1-78.
- Dick, A. S., and K. Basu, 1994. Customer loyalty: toward an integrated conceptual framework. *Journal of the Academy of Marketing Science* 22(1), 99-113.
- Ha, H. Y., and K. H. Park, 2012. Effects of perceived quality and satisfaction on brand loyalty in China: The moderating effect of customer orientation. *African Journal of Business Management* 6(22), 6745.
- Hardiansyah, R., and A. Z. Akbar, 2024. The impact of brand image and customer satisfaction on Indomaret customer loyalty in Sumbawa City. *Jurnal Cafetaria* 5(1), 51-56.
- Jasin, M., A. Firmansyah, H. Anisah, I. Junaedi, and I. Haris, 2023. The effects of customer satisfaction, perceived service quality, perceived value, and brand image on customer loyalty. *Uncertain Supply Chain Management* 11(2), 763-768.
- Kotler, P., and L. K. Keller, 2016. *Marketing Management, 10th Edition* (Pearson Education, London).
- Lahap, J., Ramli, N. S., N. M. Said, S. M. Radzi, and R. A. Zain, 2016. A study of brand image towards customer's satisfaction in the Malaysian hotel industry. *Procedia-Social and Behavioral Sciences* 224(1), 149-157.
- Laohakosol, W., and A. Sharma, 2018. Impact of product-related and social factors on purchase intention of smart-phone buyers in Nepal. *The Sankalpa: International Journal of Management Decisions* 4(1), 1-24.
- Lues, H. T., 2024. Investigating the determinants impacting fashion brand loyalty among Generation Y students in South Africa. *Journal of Contemporary Management* 21(1), 1-24.
- Ly, P. T. M. 2017. The relationship between brand experience, brand personality and customer loyalty. *International Journal of Business and Economics* 16(2), 109-126.
- Mabkhot, H., S. Salleh, and H. Shaari, 2016. The mediating effect of brand satisfaction on the relationship between brand personality and brand loyalty: Evidence from Malaysia. *Management Science Letters* 6(1), 87-98.
- Marakanon, L., and V. Panjakajornsak, 2017. Perceived quality, perceived risk and customer trust affecting customer loyalty of environmentally friendly electronics products. *Kasetsart Journal of Social Sciences* 38(1), 24-30.
- Mehta, A. M., and M. Tariq, 2020. How brand image and perceived service quality affect customer loyalty through customer satisfaction. *Academy of Marketing Studies Journal* 24(1), 1-10.
- Neupane, R., and M. Devkota, (2017). Evaluation of the impacts of service quality dimensions on patient/customer satisfaction: A study of private hospitals in Nepal. *International Journal of Social Sciences and Management* 4(3), 165-176.
- Patoding, A. A., and O. M. Muzammil, 2023. The influence of brand awareness, perceived quality, brand association, brand loyalty on purchase intention towards bear brand's consumers. *Dinasti International Journal of Digital Business Management* 4(2), 370-380.

- Phong, L., T. Nga, N. Hanh, and N. V. Minh, 2020. Relationship between brand association and customer loyalty: The case of online retail industry. *Management Science Letters* 10(7), 1543-1552.
- Poranki, K. R., 2015. The impact of brand awareness on customer satisfaction: A case study of Godfrey Phillips India Limited, India. *Research Journal of Social Science and Management* 5(1), 38-44.
- Putranto, R. S., M. Ibrahim, D. R. Karundeng, and H. Hasanuddin, 2022. The effect of brand image and brand awareness on loyalty with customer satisfaction as intervening variables. (Study On Tourists Visiting Gorontalo). *European Journal of Research Development and Sustainability* 3(3), 74-87.
- Rai, B., A. K. Khadka, and I. Shrestha, 2023. Factors affecting brand experience of passenger cars in Nepal. *The International Research Journal of Management Science* 8(1), 40-56.
- Rai, B., R. K. Dahal, and B. Ghimire, 2022. Factors Affecting Smartphone Purchase Decisions of Consumers. *Management Dynamics* 25(2), 13-22.
- Ramadhani, P., M. I. Musa, N. F. Aswar, and I. W. Hasdiansa, 2024. The effect of service quality, image, and brand trust on buying interest in shopee e-commerce: Case Study on Students of the Faculty of Economics and Business, Makassar State University. *International Journal of Humanity Advance, Business and Sciences* 1(3), 201-212.
- Romaniuk, J., and M. Nenycz-Thiel, 2013. Behavioral brand loyalty and consumer brand associations. *Journal of Business Research* 66(1), 67-72.
- Rudzewicz, A., and A. Strychalska, 2021. The influence of brand trust on consumer loyalty. *European Research Studies Journal* 24(3), 454-470.
- Saeed, R., Lodhi, R. N., A. Mehmood, U. Ishfaq, F. Dustgeer, A. Sami, and M. Ahmad, 2013. Effect of brand image on brand loyalty and role of customer satisfaction in it. *World Applied Sciences Journal* 26(10), 1364-1370.
- Samudro, A., U. Sumarwan, M. Simanjuntak, and E. Yusuf, 2020. Assessing the effects of perceived quality and perceived value on customer satisfaction. *Management Science Letters* 10(5), 1077-1084.
- Upamannyu, N. K., and S. Sankpal, 2014. Effect of brand image on customer satisfaction and loyalty intention and the role of customer satisfaction between brand image and loyalty intention. *Journal of Social Science Research* 3(2), 274-285.
- Woratschek, H., C. Horbel, and B. Popp, 2020. Determining customer satisfaction and loyalty from a value co-creation perspective. *The Service Industries Journal* 40(12), 777-799.
- Yulistiana, I., Dewi, R. V., M. Mas' adi, D. Sunarsi, and H. Erlangga, 2021. Did brand perceived quality, image product and place convenience influence customer loyalty through unique value proposition? *The Journal of Contemporary Issues in Business and Government* 27(1), 2845-2867.

Chapter 19

Factors Influencing Customers' Bank Selection Decision: A Case of Nepalese Commercial Banks

Drispa Kunwar*

Abstract

The study examines the factors influencing customers' bank selection decision in the context of Nepalese commercial banks. Bank selection decision is selected as the dependent variable. The selected independent variables are excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image. The study is based on primary data with 123 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the importance and significance of different factors influencing customers' bank selection decision in the context of Nepalese commercial banks.

The study showed that excellence ATM network has a positive effect on customers' bank selection decision. It indicates that well-maintained and extensive ATM network positively influence the bank selection decision of customers. Similarly, promptness of service has a positive effect on customers' bank selection decision. It indicates that timely delivery of banking service positively influences the bank selection decision of customers. Likewise, reliability of money has a positive effect on customers' bank selection decision. It indicates that consistency and dependability of the financial information about the financial assets positively influence the bank selection decision of customers. Further, convenient location has a positive effect on customers' bank selection decision. It indicates that convenient location of the bank branches and ATM booths positively influence the customers' bank selection decision. In addition, employee behavior has a positive effect on customers' bank selection decision. It indicates that good and supportive behavior of the employees attract the customers towards the banks. Moreover, bank reputation and image have a positive effect on customers' bank selection decision. It indicates good reputation and image of the bank positively influence the customers' bank selection decision.

Keywords: excellence ATM network, promptness of service, bank reputation and image, reliability of money, convenient location, employee behavior

1. Introduction

Understanding the requirements of customers and striving to achieve their commitment to one's bank is not an end in its self since it is only one side of the coin and working to maintain and retain them is another side. Today's marketing efforts does not end at keeping your customers satisfied but one need to climb more than their satisfaction level to granting them delight (Solvito et al., 2016). The contentment of current clients results in more services being provided at lower operational costs, which more directly leads to a rise in a bank's earnings. As a result, maintaining customers' business depends on their happiness. Customer perception of the banking services received at the bank influences whether a customer is satisfied or not (Kaur and Arora, 2019). Commercial banks, both private and nationalized banks, have been offering a range of services to draw clients for business expansion on the one hand and to broaden clientele networks on the other (Oluwaseyitan et al., 2018). Knowing the selection criteria can help banks to identify the most effective marketing strategy to attract new customers and

* Ms. Kunwar is a Freelance Researcher, Kathmandu, Nepal.

keep existing ones. Better knowledge of a bank's banking services boosts customer preference and further improves quality, efficiency of services, and cost effectiveness. In order to develop on such lines in the increasingly competitive environment, banks must obtain more information about their clients to understand their preferences, priorities, and types of services and products. Customers of banks have a wide range of options for selecting a bank based on convenience, facility types, and overall service effectiveness at a reasonable price. Understanding the criteria individuals use to select a bank may assist the bank in determining and developing the optimal marketing plan to draw in new consumers while retaining existing ones (Agarwal, 2017).

Hinson et al. (2009) argued that in a global climate characterized by financial apprehension after the shock of the global financial melt-down, banks would have to pay the most critical attention to their varied customer audiences in order to rebuild trust and foster new customer loyalty bonds. With growing competitiveness in the banking industry and similarity of services offered by banks, it has become increasingly important that banks identify the factors that determine the basis upon which customers choose between providers of financial services. Exploring such information will help banks to identify the appropriate marketing strategies that are needed to attract new customers and retain existing ones. In other words, an increased competition resulting from a decade of deregulation of the financial services industry has meant that banks find themselves faced with the task of differentiating their organizations and their offerings as a means of attracting customers (Blankson et al., 2007). As economic environment is rapidly changing and customers are becoming more demanding and sophisticated, it has become important for financial institutions to determine the factors which are pertinent to the customers' selection process (Boyd et al., 1994). According to Mokhlis (2009), competition that exists in the market for financial services presents a big challenge to the profitability of retail banking institutions of all sizes. Similarly, the competition and saturation in the banking industry requires banks to be more customer focused. On the other hand, the importance of banking and financial services in the world services industry cannot be understated (Mishkin, 2001). Meeting the needs of the customers in respect of banking service provision has emerged as a significant element of bank reputation that attracts customers to select a bank. Therefore, banks should identify the main factors that determine the basis upon which customers select banks. For firms to survive in contemporary highly competitive business environment, they should be able to attract and retain customers. To meet customers' needs, there is need to understand what is valuable to them and how they make decisions. To be profitable in a competitive industry, companies need to offer customers more value or be able to produce products and/or services more cheaply. The advancement in technology has allowed managing the work of the distant places easier due to which banks started to expand beyond the boundary which has globally increased the competition (Hedayatnia and Eshghi, 2011). Understanding customers' banks selection criteria has been argued to be helpful to banks in identifying the appropriate marketing strategies needed to attract new customers and retain existing ones (Kaynak and Kucukemiroglu, 1992). According to Almossawi (2001), to plan an appropriate marketing strategy for attracting new customers, commercial banks need to identify the criteria on which potential customers determine their bank selection decision.

By understanding the needs and wants of customers, banks can improve the quality of service. Sabir et al. (2014) concluded that there is a significant relationship between service quality attributes and customer satisfaction. The study also revealed that there is a positive relationship between customer satisfaction and customer loyalty. Likewise, the study concluded that service quality leads to satisfied customers and customer satisfaction leads to customer loyalty. In today's competitive world, banks can get competitive advantage by providing superior services to their customers. Similarly, Kaakeh et al. (2019) pointed out that attitude and awareness affect intention directly, while image, awareness, Shariah compliance and individualism affect attitude directly and intention indirectly mediated by

attitude. Likewise, Nugraha et al. (2022) revealed that there are obstacles for prospective customers of Islamic banks in responding to marketing stimuli due to the perception of risk, image, and weak marketing reach that have dominated passive resistance to Islamic banks. Similarly, Zineldin (1996) revealed that friendliness and helpfulness of personnel, accuracy in account/transaction management, availability of loans, and provision of services were the most important factors. Likewise, Dogbe et al. (2019) suggested cost as a very significant influencer in the selection of a bank. To attract students, banks must focus on reducing the minimum balance, charge less for maintaining students' savings account, and charge less for using ATMs. Further, Dao et al. (2021) found that customer policy has a positive effect on customers' deposit decisions in a bank. The results also showed that other factors such as employee image, brand, interest rate, relative influencing, and transaction time positively impact the choice of bank for the deposit decisions of customers. However, the bank's promotion strategies had no impact on the choice of bank for the deposit decisions of customers. Besides, employee image is the most influential factor in the deposit decisions, followed by the bank's brand and interest rate. Similarly, Moosa et al. (2023) indicated that "religious reasons only", "Islamic reputation and image", "economic and financial reputation" and having an "involvement in the community" are the selection criteria considered to be most important by both males and females. The results also suggest that there are no significant differences in the selection criteria of customers based on gender when choosing an Islamic bank. Moreover, Laroche et al. (1986) found that speed of services, and factors relating to the competence and friendliness of bank personnel and convenience of location were the major factors which consumers perceived as important in their selection of a bank. Likewise, Ulengin (1998) indicated that customers in Turkey were more interested in the functional quality of financial services rather than the technical quality dimension. The study further revealed that delivery channels and customer relations gain are important in bank choice process.

In the context of Nepal, Wagle (2022) examined the factors influencing bank selection decision by using a set of dependent (bank selection decision) and independent variables (service convenience, bank charges, bank reputation and employee behavior). The results revealed that service convenience and bank charges have a significant positive association with the bank selection decision. The bank reputation has a negative and employee behavior has a positive but both have insignificant impact on bank selection decision. Gautam and Dhital (2004) revealed that customers were found satisfied with those banks where customers had to spend less time on waiting, and the employees' behavior was good. Likewise, at the time of selecting a bank for financial transaction, customer consider about service quality, behavior of bank staff. Further, Shrestha (2019) revealed that most of the customers have positive attitudes towards ATM services in terms of responsiveness, convenience, ease of use, and speed. The study also revealed that Nepalese commercial banks have adopted ATMs as the way for providing efficient and effective services to their customers. Sanil and Paudel (2017) concluded that convenience significantly impacts the banking decisions among working people in Kathmandu Valley which includes factors like convenient location, close to home, adequate number of locations, security, convenience, reputation of organization and proximity. Bank should focus more on items like accurate account information and pleasant bank atmosphere.

The above discussion shows that empirical evidences vary greatly across the studies on the factors influencing customers' bank selection decision. 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 factors influencing customers' bank selection decision in Nepalese commercial banks. Specifically, it examines the relationship of excellence ATM

network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image on customers' bank selection decision 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 123 respondents through structured questionnaire. The respondents' views were collected on excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image 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 the customers' bank selection decision depends upon excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image. Therefore, the model takes the following form.

$$\text{BSD} = \beta_0 + \beta_1 \text{EAN} + \beta_2 \text{PS} + \beta_3 \text{RM} + \beta_4 \text{CL} + \beta_5 \text{EB} + \beta_6 \text{BRI} + e$$

Where,

BSD = Bank selection decision

EAN = Excellence ATM network

PS = Promptness of services

RM = Reliability of money

CL = Convenient location

EB = Employee behavior

BRI = Bank reputation and image

Excellence ATM network 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 provide prompt services to the customers", "Balance enquiry could be done easily through the ATM service of the bank" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.981$).

Promptness of service 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 "Loans are easily available or accessible", "The information provided on services is among the best in the industry" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.989$).

Reliability of money 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 bank provides safety of funds”, “Bank keeps privacy of my financial statements”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.984$).

Convenient location 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 location of branches is near to me”, “Bank is located in a safe neighborhood with low crime rate” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.977$).

Employee behavior 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 “In my bank, there should be friendly or pleasing manner of staff”, “Employee’s deals honestly with a client” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.979$).

Bank reputation and image 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 bank’s image is adding value to me as a customer”, “The bank has a good reputation among my friends” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.990$).

Bank selection decision 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 decision towards of banks depends on excellence ATM network”, “Reliability of money gives me satisfaction while selecting bank” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.991$).

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

Excellence ATM Network

Bank with an extensive and well-maintained ATM network offers convenience to its customers. Easy access to ATMs means customers can withdraw cash, deposit funds, and perform other transactions conveniently, without having to travel far from their usual routes. This convenience factor often weighs heavily in customers’ decision-making process when choosing a bank. According to Ahmed (2015), excellence ATM network has a positive influence on customer’s choice of bank. Dao et al. (2021) pointed out that there is a positive correlation between ATM banking and customers bank selection. Likewise, Saleh et al. (2013) ATM facility, convenient ATM locations, 24 hours availability of ATM services and speedy service are positively related to the customers’ bank selection decision. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between excellence ATM network and bank selection decision.

Promptness of services

The promptness of services is a key factor in individuals’ bank selection decisions. Banks that prioritize efficiency, convenience, and customer satisfaction by delivering prompt services are more likely to attract and retain customers in today’s competitive banking industry. According to Siddique (2012), most important factors influencing customers for selecting a private commercial bank are effective

and efficient customer services, speed and quality services; image of the bank, online banking, and well management. Likewise, Raza and Hanif (2011) found that promptness of service has a positive relationship with selection of bank. In addition, Tesfaye et al. (2019) showed that the service quality factors and convenience factors have significant and positive relation with bank selection decision. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between promptness of services and bank selection decision.

Reliability of money

Banks with a reputation for reliability are more likely to attract customers seeking a secure place to deposit their money. This trust is often built over time through consistent service, transparent practices, and adherence to regulations. According to Singh and Agarwal (2016), safety rate showed a positive relationship between reliability of money and bank selection. In addition, Aregbeyen (2011) stated that customer retention in banks is influenced by the corporate image of the banks based on the reliability of money which showed positive relationship between reliability of money and bank selection. Moreover, Njane (2012) pointed out the positive relationship between reliability of money and bank selection. Reliability and assurance play a significant role in influencing individuals' bank selection decisions, as they seek to safeguard their hard-earned money. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between reliability of money and bank selection decision.

Convenient location

Safakli (2007) found that convenience of location is significantly positive with the selection of bank. Likewise, Sharma and Rao (2010) found a positive relationship between convenient location and selection of bank. Further, Hedayatnia and Eshghi (2011) found that the important factors determining customers' selection are convenience of bank location and services. In addition, Srouji et al. (2015) stated that location of branches and facilities provided by banks showed a positive relationship between convenient location and customers' bank selection decision. Further, Rehman and Ahmed (2008) showed a positive relationship between convenient location and bank selection. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between convenient location and bank selection decision.

Employee behavior

Employee behavior can significantly influence individuals' decisions when selecting a bank. Positive interactions with bank employees can create a sense of trust, reliability, and overall satisfaction, all of which are crucial factors in the decision-making process. Mu'azu Saidu et al. (2013) pointed out customers will be satisfied when the bank staff are responsive which showed positive relationship between employee behavior and customer bank selection decision. Likewise, Njane (2013) pointed out the positive relationship between employee behavior and selection of bank. When customers feel valued and supported by bank staff, they are more likely to develop a positive perception of the bank and consider it favorably for their banking needs. Moreover, Krisnanto and Novianti (2019) found a positive relationship between employee behavior and selection of bank. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between employee behavior and bank selection decision.

Bank reputation and image

Abed *et al.* (2022) found that bank image moderates the relationship between customer satisfaction and customer loyalty. Similarly, Alnaser *et al.* (2017) revealed that customer satisfaction normally has an impact on the bank image a customer will create, ultimately affecting his or her customer loyalty and recommendation to a certain bank. Likewise, Narteh and Braimah (2020) showed that the dimensions of corporate reputation have a direct impact on bank selection by customers, and that brand image could also be used to improve social and ethical dimension of corporate reputation to ensure bank selection by retail customers. Further, Onyancha (2013) found that the bank brand image has positive effects on customer satisfaction and loyalty. It means that a positive bank brand image not only increases customer loyalty directly, but it also improves customer satisfaction through the enhancing of perceived service quality, which in turn increases the loyalty of customers. In addition, Krisnanto and Novianti (2019) found that the service quality and corporate image have a positive effect on customer satisfaction. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between Bank reputation and image and bank selection decision.

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 Kendal's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 123 observations. The dependent variable is BSD (Bank selection decision). The independent variables are EAN (Excellence ATM network), PS (Promptness of service), RM (Reliability of money), CL (Convenient location), EB (Employee behavior) and BRI (Bank reputation and image).

Variables	Mean	S.D.	BSD	EAN	PS	RM	CL	EB	BRI
BSD	3.613	1.034	1						
EAN	3.256	1.021	0.582**	1					
PROM	3.326	0.974	0.510**	0.644**	1				
RM	3.416	1.031	0.607**	0.660**	0.734**	1			
CL	3.39	1.075	0.699**	0.592**	0.547**	0.608**	1		
EB	3.465	1.055	0.601**	0.565**	0.567**	0.635**	0.710**	1	
BRI	3.447	1.058	0.586**	0.638**	0.663**	0.716**	0.675**	0.707**	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 between the variables. The study shows that excellence ATM network is positively correlated to customers' bank selection decision. It indicates that well-maintained and extensive ATM network positively influence the bank selection decision of customers. Similarly, promptness of service is positively correlated to customers' bank selection decision. It indicates that timely delivery of banking service positively influences the bank selection decision of customers. Likewise, reliability of money is positively correlated to customers' bank

selection decision. It indicates that consistency and dependability of the financial information about the financial assets positively influence the bank selection decision of customers. Further, convenient location is positively correlated to customers' bank selection decision. It indicates that convenient location of the bank branches and ATM booths positively influence the customers' bank selection decision. In addition, employee behavior is positively correlated to customers' bank selection decision. It indicates that good and supportive behavior of the employees attract the customers towards the banks. Moreover, bank reputation and image are positively correlated to customers' bank selection decision. It indicates good reputation and image of the bank positively influence the customers' bank selection decision.

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 excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image on customers bank selection decision in the context of Nepalese commercial banks.

Table 2

Estimated regression results of excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image on customers bank selection decision in the context of Nepalese commercial banks

The results are based on 123 observations using linear regression model. The model is $BSD = \beta_0 + \beta_1 EAN + \beta_2 PS + \beta_3 RM + \beta_4 CL + \beta_5 EB + \beta_6 BRI + e_{it}$, where the dependent variable is BSD (Bank selection decision). The independent variables are EAN (Excellence ATM network), PS (Promptness of service), RM (Reliability of money), CL (Convenient location), EB (Employee behavior) and BRI (Bank reputation and image).

Model	Intercept	Regression coefficients of						Adj. R_{bar}^2	SEE	F-value
		EAN	PS	RM	CL	EB	BRI			
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)**					0.784 (14.651)**		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)**	0.273 (2.898)**					0.599	0.654	92.199
8	0.765 (3.952)**	0.298 (3.215)**	1.520 (1.352)	0.698 (5.776)**				0.684	0.581	89.159
9	0.575 (3.516)**	0.173 (2.183)*	1.250 (1.351)	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	0.581 (3.530)**	0.160 (2.011)*	1.520 (1.610)	0.243 (1.947)	0.505 (5.381)**	0.047 (0.446)	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.
- Bank selection decision is the dependent variable.

Table 2 shows that the beta coefficients for excellence ATM networks are positive with customers' bank selection decision. It indicates that excellence ATM networks has a positive impact on customers' bank selection decision. This finding is similar to the findings of Ahmed (2015). Similarly, the beta coefficients for promptness of service are positive with customers' bank selection decision. It indicates that promptness of service has a positive impact on customers' bank selection decision. This finding is consistent with the findings of Siddique (2012). Likewise, the beta coefficients for reliability of money are positive with customers' bank selection decision. It indicates that reliability of money has a positive impact on customers' bank selection decision. This finding is similar to the findings of Aregbeyen (2011). Further, the beta coefficients for convenient location are positive with customers' bank selection decision. It indicates that convenient location has a positive impact on customers' bank selection decision. This finding is consistent with the findings of Safakli (2007). In addition, the beta coefficients for employee behavior are positive with customers' bank selection decision. It indicates that employee behavior has a positive impact on customers' bank selection decision. This finding is similar to the findings of Krisnanto and Novianti (2019). Moreover, the beta coefficients for bank reputation and image are positive with customers' bank selection decision. It indicates that bank reputation and image have a positive impact on customers' bank selection decision. This finding is consistent with the findings of Onyancha (2013).

4. Summary and conclusion

The rising competition within the banking sector and the similarity of services offered by banks makes it critical for the banks to pinpoint the important determinants of bank customers' selection decision. Competition in providing effective and quality services to their customers is becoming a key determinant of the growth and prosperity of the banking sector in Nepal. Customers have many alternatives to selecting a bank. It is important to grasp bank selection criteria upon which customers make a choice from providers of monetary services to shape their service delivery and to make a powerful growth strategy.

This study attempts to examine factors influencing customers' bank selection decision in the context of Nepalese commercial banks. The study is based on primary data with 123 observations.

The major conclusion of this study is that excellence ATM network, promptness of service, reliability of money, convenient location, employee behavior, and bank reputation and image have positive impact on customers' bank selection decision. It indicates standard setting in high-definition ATM service, timely delivery of ATM service, consistency and dependability of the financial information about the financial assets, and convenient ATM location as per the necessity of the customers', and positive behavior of employees lead to influence the customers' bank selection decision. Likewise, the study also concluded that convenient location followed by reliability of money is the most influencing factor that explains the changes in the consumers' bank selection decision in the context of Nepalese commercial banks.

References

- Abed, H. M., M. I. Nofal, F. Alnasr, G. A. A. Alsheikh, and E. A. T. Alnawafleh, 2022. The influence of service quality, customer satisfaction and bank image on customer loyalty in Palestinian Islamic Banks. *Journal of Management Information and Decision Sciences* 25(4), 1-18.
- Agarwal, P., 2017. Influencing factors for bank selection intention in Ethiopia: A study conducted in Arba Minch Town. *Business and Management Research Journal* 7(2), 10-16.
- Almossawi, M., 2001. Bank selection criteria employed by college students in Bahrain: An empirical analysis.

- International Journal of Bank Marketing* 19(3), 115-125.
- Alnaser, F., M. Ghani, S. Rahi, M. Mansour, and H. Abed, 2017. Determinants of customer loyalty: the role of service quality, customer satisfaction and bank image of Islamic banks in Palestine. *International Journal of Economic Management Science* 6(1), 2162-2169.
- Aregbeyen, O., 2011. The determinants of bank selection choices by customers: Recent and extensive evidence from Nigeria. *International Journal of Business and Social Science* 2(22), 276-288.
- Blankson C., J. Cheng, and N. Spears, 2007. Determinants of banks selection in USA, Taiwan and Ghana: International. *Journal of Bank Marketing* 25(7), 476-489.
- Boyd, W. L., M. Leonard, and C. White, 1994. Customer preferences for financial services: an analysis. *International Journal of Bank Marketing* 12(1), 9-15.
- Dao, L. K. O., H. H. Loc, V. C. Nguyen, L. T. T. Hang, and T. T. Do, 2021. Factors affecting the choice of banks: Do bank's interest rate, employee image and brand matter? *The Journal of Asian Finance, Economics and Business* 8(1), 457-470.
- Dogbe, C. S. K., B. A. Bamfo, and S. A. Sarsah, 2019. Determinants of bank selection by university students in Ghana. *International Journal of Developing and Emerging Economies* 7(1), 13-28.
- Gautam, T., and M. S. Dhital, 2004. Customer satisfaction in Nepalese commercial banks. *Journal of Management and Development Review* 1(2), 1-18.
- Hedayatnia, A., and K. Eshghi, 2011. Bank selection criteria in the Iranian retail banking industry. *International Journal of Business and Management* 6(12), 222-234.
- Hinson, R., J. Dasah, and N. Owusu-Frimpong, 2009. Undergraduate first-time bank customers' perception of service quality in Ghana. *International Business Economics* 2(1), 28-36.
- Kaakeh, A., M. K. Hassan, and S. F. Van Hemmen Almazor, 2019. Factors affecting customers' attitude towards Islamic banking in UAE. *International Journal of Emerging Markets* 14(4), 668-688.
- Kaur, H., and S. Arora, 2019. Demographic influences on consumer decisions in the banking sector: Evidence from India. *Journal of Financial Services Marketing* 24(5), 81-93.
- Kaynak, E., and O. Kucukemiroglu, 1992. Bank and product selection: Hong Kong. *International Journal of Bank Marketing* 10(1), 3-16.
- Krisnanto, U., and R. Novianti, 2019. Examining the relationships between service quality, corporate image, customer satisfaction, and customer loyalty for an Indonesian bank. *Expert Journal of Business and Management* 7(1), 31-35.
- Laroche, M., J. T. Rosenblatt, and T. Manning, 1986. Services used and factors considered important in selecting a bank: An investigation across diverse demographic segments. *International Journal of Bank Marketing* 4(1), 35-55.
- Mishkin, F. S. 2001. The transmission mechanism and the role of asset prices in monetary policy. *National Bureau of Economic Research* 4(8), 12-22.
- Mokhlis, S., N. H. N. Mat, and H. S. Salleh, 2008. Commercial bank selection: The case of undergraduate students in Malaysia. *International Review of Business Research Papers* 4(5), 258-270.
- Moosa, R., 2022. The role of customer selection criteria, banking objective, CSR and service quality in enhancing positive customer perception: An Islamic banking perspective. *International Journal of Economics and Finance Studies* 14(3), 388-408.
- Mu'azu Saidu Badara, N. K., N. Mat, A.M. Mujtaba, A.N. Al-Refai, A.M Badara, and F.M. Abubakar, 2013. Direct effect of service quality dimensions on customer satisfaction and customer loyalty in Nigerian Islamic bank. *Management* 3(1), 6-11.
- Narteh, B., and M. Braimah, 2020. Corporate reputation and retail bank selection: the moderating role of brand image. *International Journal of Retail and Distribution Management* 48(2), 109-127.

- Njane, J. G., 2013. An investigation of factors affecting customer retention in Barclays bank of Kenya. *International Journal of Business Studies* 7(6), 49-60.
- Nugraha, K., M. Arief, S. B. Abdinagoro, and P. Heriyati, 2022. Factors influencing bank customers' orientations toward Islamic banks: Indonesian banking perspective. *Sustainability* 14(19), 125-136.
- Oluwaseyitan, R. C., H. Hashim, and R. N. R. Yusof, 2018. Determinants of bank selection: An international student perspective. *International Journal of Academic Research in Business and Social Sciences* 8(5), 741-761.
- Onyancha, G. K. 2013. The impact of bank brand image on customer satisfaction and loyalty: A case of Kenya commercial bank. European. *Journal of Business and Management* 5(21), 35-39.
- Raza, S. A., and N. Hanif, 2013. Factors affecting internet banking adoption among internal and external customers: A case of Pakistan. *International Journal of Electronic Finance* 7(1), 43-52.
- Rehman, H. U., and S. Ahmed, 2008. An empirical analysis of the determinants of bank selection in Pakistan: A customer view. *Pakistan Economic and Social Review* 46(2), 147-160.
- Sabir, R. I., O. Ghafoor, N. Akhtar, I. Hafeez, and A.U. Rehman, 2014. Factors affecting customer satisfaction in banking sector of Pakistan. *International Review of Management and Business Research* 3(2), 1014.
- Safakli O., 2007. Research on the basic motivational factors in consumer bank selection: Evidence from Northern Cyprus Bank. *Bank System* 2(4), 67-77.
- Saleh, M. S., M. R. M. Rosman, and N. K. Nani, 2013. Bank selection criteria in a customers' perspective. *Journal of Business and Management* 7(6), 15-20.
- Sanil, S., and P. K. Paudel, 2017. Determinants of bank selection among working people in Kathmandu valley. *The International Research Journal of Management Science* 2(1), 118-134.
- Sharma, R. K., and S. A. Rao, 2010. Bank selection criteria employed by MBA Students in Delhi: An Empirical Analysis. *Journal of Business Studies* 1(2), 56-69.
- Shrestha, P., 2019. Banking customer attitudes toward ATM service in Nepal. *International Journal of Advances in Scientific Research and Engineering* 20(35), 88-93.
- Siddique, H. H., 2012. Bank selection decision criteria employed by Indian expatriates in sultanate of Oman: an empirical analysis. *International Journal of Business and Management Studies* 4(2), 55-64.
- Singh, S. P., and T. Agarwal, 2016. Determinants of bank selection: a study of retail banking consumers in Gwalior. *Journal of Applied Management-Jidnyasa* 8(1), 9-17.
- Solvito, B., D. Dons, and J. James, 2016. Bank strategic positioning and some determinants of bank selection. *International Journal of Bank Marketing* 14(6), 12-22.
- Srouji, A. F., M. S. Ab Halim, Z. Lubis, and M. E. Hamdallah, 2015. Determinants of bank selection criteria in relation to Jordanian Islamic and conventional banks. *International Journal of Economics, Commerce and Management* 3(10), 294-306.
- Tesfaye, S., M. Abera, and T. Mengesha, 2019. Factors affecting customer's bank selection decision: a study on commercial bank in Jimma town Ethiopia. *International Journal of Islamic Business and Economics* 3(1), 23-36
- Ulengin, B. 1998. Using hierarchical information integration to examine customer preferences in banking. *International Journal of Bank Marketing*, 16(5), 202-210.
- Wagle, S. 2022. Factors influencing bank selection decision in Nepal. *Patan Prospective Journal* 2(2), 232-240.
- Zineldin, M. 1996. Bank strategic positioning and some determinants of bank selection. *Journal of Bank Marketing* 14(6), 12-22.

Chapter 20

Impact of Service Quality Dimensions on Customer Satisfaction and Customer Loyalty in Nepalese Commercial Banks

Susant Paudel*

Abstract

This study examines the impact of service quality dimensions on customer satisfaction and loyalty in Nepalese commercial banks. Customer satisfaction and customer loyalty are selected as the dependent variables. Likewise, flexibility, reliability, responsiveness, empathy and assurance are selected as the independent variables. The primary source of data is used to assess the opinions of the respondents regarding service quality dimensions and level of satisfaction and customer loyalty in Nepalese commercial banks. The study is based on primary data with 122 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 service quality dimensions on customer satisfaction and loyalty in Nepalese commercial banks.

The study showed that flexibility has a positive effect on customer satisfaction and loyalty. It indicates that higher the level of flexibility in the bank services, higher would be the customer satisfaction and loyalty. The result also showed the reliability has a positive effect on customer satisfaction and loyalty. It indicates that higher level of reliability in the bank services leads to increase in customer satisfaction and loyalty. Similarly, responsiveness has a positive effect on customer satisfaction and loyalty indicating better and quick response of the employees leads to increase in customer satisfaction and loyalty. The result also showed that empathy has a positive effect on customer satisfaction and loyalty. It means that higher the level of empathy, higher would be the customer satisfaction and loyalty. Likewise, assurance has a positive effect on customer satisfaction and loyalty. It means that better assurance of the services in banks leads to increase in customer satisfaction and loyalty.

Keywords: flexibility, reliability, responsiveness, empathy, customer satisfaction, loyalty

1. Introduction

In the era of global competition recently, organizations are required to be able to improve their performance through quality improvement. This can be done through fulfilling customer needs. Quality banking management ensures the organization operates smoothly, adapts to changes, and achieves its goals in a sustainable manner, thereby driving long-term success and competitiveness in the financial sector. Customer relationship management focuses on building and maintaining strong relationships through exceptional service and personalized solutions, which enhances customer loyalty and retention. The key to surviving in a global market is to focus on service quality for customers (Hu et al., 2009). Organizations can claim success when customer satisfaction is attained. Organizations need a capacity to get many customers in order to survive or exist. Excellent services, responding customers' demands can directly increase satisfaction. This is an indicator of satisfaction level to the services' quality. This can be measured by assessing their purchase and consumption experience on particular products, services, brands, and company name (Gutek et al., 2002). Maintaining strong relationships with customers through excellent service, understanding their needs, and providing personalized solutions is crucial for enhancing customer loyalty and retention. Excellent service forms the bedrock of a positive

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

customer experience, ensuring that interactions with the company are consistently pleasant, efficient, and satisfactory. By deeply understanding customer needs, businesses can tailor their offerings to meet specific requirements and preferences, demonstrating a genuine commitment to their satisfaction. This personalized approach not only addresses individual customer concerns but also creates a sense of value and appreciation.

Surviving and thriving in the global market hinges significantly on focusing on service quality for customers. In an era where competition is fierce and options are abundant, providing exceptional service is not just a differentiator but a necessity. Quality service builds trust and loyalty, fostering long-term relationships that transcend geographical boundaries. It involves understanding and anticipating customer needs, offering personalized solutions, and ensuring a seamless experience at every touchpoint. This means integrating advanced technology to enhance convenience and efficiency, training staff to deliver courteous and knowledgeable support, and consistently seeking feedback to improve (Wong and Sohal, 2006). Additionally, service quality encompasses reliability, responsiveness, and a commitment to solving customer issues promptly and effectively. As markets globalize, customers expect the same high standards regardless of location, making it imperative for businesses to maintain uniformity in service delivery. By prioritizing service quality, companies can enhance their reputation, attract a broader customer base, and navigate the complexities of the global market with agility and resilience. In essence, exceptional service quality not only meets but exceeds customer expectations, fostering brand loyalty and driving sustainable growth in an increasingly interconnected world (Berry and Parasuraman, 2004).

Mohapatra *et al.* (2024) revealed that customer satisfaction significantly affects retention, with direct influences from efficiency, service quality, and reliability. Specifically, when customer satisfaction acts as a mediator, reliability, efficiency, and service quality demonstrate significant impacts on customer retention. The study underscores the importance of reliability, service quality, efficiency, and customer satisfaction as key components driving customer retention in Electronic Banking, providing valuable insights for banks to enhance their e-banking services and ensure sustained customer loyalty in the digital age. Goel *et al.* (2023) revealed the significance of service quality factors, particularly reliability, responsiveness, and empathy, in influencing customer satisfaction and overall bank performance. Additionally, safety and specificity emerged as crucial dimensions shaping customer perceptions and loyalty in the competitive banking landscape. Inuwa and Igbadumhe (2023) aimed to explore the relationship between service quality and customer loyalty within commercial banks in Bauchi Metropolis, Bauchi state, Nigeria, focusing on dimensions such as reliability, assurance, and tangibles. The study revealed that reliability, assurance, and tangibles significantly and positively influence customer loyalty in commercial banks in Bauchi Metropolis. The findings suggested that enhancing service quality, particularly in terms of reliability, assurance, and tangibles, can effectively foster customer loyalty in commercial banks. Etale *et al.* (2022) examined the relationship between service innovation and customer satisfaction within the context of transportation firms in Yenagoa, Bayelsa State, focusing on technological and service process innovations. The findings revealed a significant positive relationship between technological and service process innovations and customer satisfaction, underscoring the importance of innovation in meeting customer needs and improving operational effectiveness. The study advocates for continuous innovation in service offerings within the transportation sector to align with evolving customer demands, emphasizing the importance of enhancing service processes for greater efficiency and effectiveness in meeting customer expectations.

Ayinaddis (2023) analyzed the relationship between service innovation, customer satisfaction, and loyalty intention within the banking sector. The study revealed a significant positive relationship between service innovation and customer satisfaction, indicating that banks' capacity to achieve

customer satisfaction was significantly influenced by service innovation. Moreover, a statistically significant and positive relationship between service innovation and loyalty intention was identified, with service innovation exerting both direct and indirect effects on loyalty intention through the mediation of customer satisfaction. Additionally, path analysis demonstrated a direct positive effect of customer satisfaction on loyalty intention, further supporting the importance of customer satisfaction in driving loyalty within the banking sector. Al-Slehat (2021) analyzed the relationship between banking service quality, customer satisfaction, and customer loyalty in the context of the competitive banking environment in Jordan, with a particular focus on testing customer satisfaction as a mediating variable. The findings revealed that banking service quality, across all its dimensions, positively influences customer loyalty, with customer satisfaction serving as a mediator in this relationship. Specifically, the study revealed that enhancing the tangibility dimension of banking service quality could be instrumental in promoting customer satisfaction and, consequently, customer loyalty within the Jordanian commercial banking sector. Obananya (2020) investigated the service quality and customers' loyalty in Nigerian commercial banking industry through different dimensions (tangibility, reliability, responsiveness, assurance) on customer loyalty in South-East Nigerian banks using the SERVQUAL model. The study showed that tangibility, reliability, responsiveness, and assurance significantly influence customer loyalty in the region's banking industry, emphasizing the importance of these dimensions for customer satisfaction and loyalty. Clear linkage established between service quality and customer loyalty levels, advocating for tailored strategies focusing on tangibles, reliability, responsiveness, and assurance to enhance customer satisfaction and loyalty in Nigerian banking sector.

In the context of Nepal, Ayer (2023) showed that convenience, reliability, ease of use, security, time saving and perceived transaction benefits have positive impact on customer satisfaction. The study concluded that e-banking services play vital role in order to increase the level of satisfaction. The study also concluded that convenience followed by time saving are the most influencing factor that explains customer satisfaction towards e-banking services in Nepalese commercial banks. Pathak *et al.* (2022) examined the impact of internet banking service quality on customer satisfaction in Nepalese commercial banks. The study showed that speed of delivery, ease of use, reliability, privacy and security, enjoyment and control have positive impact on customer satisfaction in Nepalese commercial banks. The study also concluded that reliability followed by speed of delivery is the most influencing factor that explains the change in the level of customer satisfaction in Nepalese commercial banks. Bist (2020) examined the perceived banking security and customer satisfaction in Nepalese commercial banks. The study showed that awareness, responsiveness, reliability, ease of use, trust and privacy have positive impact on customer satisfaction. The study concluded that privacy followed by responsiveness is the most influencing factor that explains customer satisfaction towards e-banking services in Nepalese commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of service quality dimensions on customer satisfaction and loyalty in 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 analyze the impact of service quality dimensions on customer satisfaction and loyalty in Nepalese commercial banks. Specifically, it examines the relationship of flexibility, reliability, responsiveness, empathy and assurance with customer satisfaction and loyalty 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 122 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on flexibility, reliability, responsiveness, empathy, assurance and level of satisfaction and loyalty in the context of Nepalese commercial banks. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that customer satisfaction and loyalty depend upon service quality dimensions. The dependent variables selected for the study are customer satisfaction and customer loyalty. Similarly, the independent variables selected for the study are flexibility, reliability, responsiveness, empathy and assurance. Therefore, the models take the following forms:

$$CS = \beta_0 + \beta_1 FLE + \beta_2 REL + \beta_3 RES + \beta_4 AS + \beta_5 EMP + e$$

$$CL = \beta_0 + \beta_1 FLE + \beta_2 REL + \beta_3 RES + \beta_4 AS + \beta_5 EMP + e$$

Where,

CS= Customer satisfaction

CL= Customer loyalty

FLE = Flexibility

REL= Reliability

RES= Responsiveness

AS= Assurance

EMP= Empathy

Customer satisfaction was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include "As a customer, service innovation has increased my satisfaction with the bank", "I am satisfied with bank for level of service delivery currently" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.941$).

Customer loyalty was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include "I speak positive things to other people about the bank in which I have an account" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.906$).

Flexibility was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include "The bank has modern equipment that is adequate and visible for customer use", "Bank has a sufficient number of self-service machines", and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.889$).

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

and sample items include “Customers can expect the bank to provide secure and accurate service”, “Customers will receive personalized services from bank employees”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.901$).

Responsiveness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “When a customer has a problem, the bank shows genuine interest in resolving the issue”, “Employees at banks are never too busy to respond to customer inquiries”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.904$).

Assurance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “When I conduct transactions, my bank’s employees correctly use their services and make me feel secure”, “Bank employees will always be courteous when dealing with customer inquiries”, and so on. The reliability of the feature was measured by computing the Cronbach’s alpha ($\alpha = 0.909$).

Empathy was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “The staff at my bank always acts as if they are the one with the issue”, “The employees are aware of my needs and give me information accordingly” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.929$).

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

Flexibility

Loonam and O’Loughlin (2008) has proposed 10 e-service dimensions that affect the service quality of e-banking in Ireland, including: web usability, security, quality of information, accessibility, trust, reliability, flexibility, responsiveness, self-recovery and personalization/ customization. Nguyen et al. (2020) examined the relationships and the impacts of service quality, customer satisfaction and switching costs on customer loyalty of e-banking in commercial banks. The results showed that reliability, responsiveness, service capacity, empathy, flexibility and tangibility have positive correlations with customer satisfaction. De Grahl et al. (2012) revealed that logistics service providers (LSPs) flexibility is a strong driver of all core dimensions of customer loyalty (i.e., retention, extension, and referrals) and thus a source of competitive advantage for LSPs. Powers and Jack (2008) showed that there is a positive relationship between the use of internal volume flexible strategies, volume flexible capability, customer satisfaction, and organizational performance. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship of flexibility with customer satisfaction and loyalty.

Reliability

Customer loyalty fostered by organizations results in increased customer satisfaction. According to Ariff et al. (2013), ensuring that customers remain loyal, it must be ensured that they are satisfied with the provided reliable services. Customers will tend to be loyal if the bank is trustworthy, committed to service, reliable and efficient in communicating with customers, and is able to solve problems properly (Coelho and Henseler, 2012; Flint et al., 2011). Loyal customers often become brand advocates. They share their positive experiences with friends, family, and online reviews, driving new business. Reliability strengthens this effect by ensuring that every interaction reinforces the customer’s positive perception. Reliability is a key driver of both customer satisfaction and loyalty. By

consistently delivering dependable service, businesses can create a foundation of trust and satisfaction that encourages customers to return and advocate for the brand, ultimately leading to long-term success (Hennig-Thurau et al., 2002). Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship of reliability with customer satisfaction and loyalty.

Responsiveness

Khan and Fasih (2014) determined the satisfaction level of banking customers regarding quality of different services provided by their bank and their loyalty with the respective bank. The findings indicate that service quality and all its dimensions have significant and positive association with customer satisfaction and customer loyalty. The study also revealed that responsiveness is closely linked to customer satisfaction and loyalty, playing a pivotal role in shaping a customer's overall experience with a business. Responsiveness not only aids in developing loyalty in customers, but it builds long-term relationships with them (Ndubisi, 2006). The results indicated that responsiveness has positive and significant effects on customer satisfaction and profitability. Responsiveness includes not only reacting to customer needs but also anticipating them. Proactive communication, such as providing updates on orders or informing customers of potential delays, helps manage expectations and reduces frustration (Paul et al., 2016). By ensuring that customer interactions are timely, helpful, and personalized, banks can significantly enhance satisfaction. This, in turn, fosters loyalty, as customers are more likely to continue engaging with and advocating for a brand that consistently meets their needs. In the competitive landscape, responsiveness not only improves customer experiences but also strengthens the overall customer relationship, driving long-term success (Assegaff, 2016). Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship of responsiveness with customer satisfaction and loyalty.

Assurance

Assurance builds trust, which is a cornerstone of customer loyalty. In the case of private sector banks, knowledge of products, response to need, solving questions, fast service, quick connection to the right person, assurance and efforts to reduce queuing time were found to be the factors that are positively associated with overall satisfaction (Paul et al., 2016). Joseph et al. (2005) revealed the assurance has a positive and significant relationship with customer satisfaction. By instilling confidence in their competence, integrity, and commitment to quality, companies can significantly enhance customer satisfaction. This assurance leads to increased trust and emotional connections, which are critical components of customer loyalty. In a competitive marketplace, businesses that effectively provide assurance can differentiate themselves, retaining satisfied customers and fostering long-term loyalty, ultimately driving sustained success. Kheng et al. (2010) examined the impact of service quality on customer loyalty towards the selected banks in Penang, Malaysia. The results showed that assurance of service quality is positively correlated to customer loyalty in Malaysia. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship of assurance with customer satisfaction and loyalty.

Empathy

Empathy plays a crucial role in fostering customer satisfaction and loyalty. According to Iglesias and Guillen (2004), customer satisfaction is greatly driven by empathy. Empathy involves understanding and sharing the feelings and needs of customers. When employees demonstrate empathy by listening actively and attentively to customer concerns, it creates a sense of validation and understanding, leading to higher satisfaction levels. Mahmood et al. (2018) examined the influence

of service quality on customer loyalty, and aimed to determine if this relationship was mediated by customer satisfaction. The study confirmed a positive link between empathy and customer satisfaction. The study also verified that empathy serves as a tool to create long-term relationships between firm and customers. Hennig-Thurau (2004) revealed that offering quality service have positive impact on overall customer satisfaction. The results proved that empathy and responsiveness play the most important role in customer satisfaction level followed by flexibility, assurance, and finally the bank reliability. Prioritizing empathy in customer interactions can significantly enhance satisfaction and loyalty, ultimately contributing to the bank's growth and prosperity. Based on it, this study develops the following hypothesis.

H₅: There is a positive relationship of empathy with customer satisfaction and 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 coefficient matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation coefficients are based on 122 observations. The dependent variables are CS (Customer satisfaction) and CL (Customer loyalty). The independent variables are FLE (Flexibility), REL (Reliability), RES (Responsiveness), AS (Assurance) and EMP (Empathy).

Variables	Mean	SD	CS	CL	FLE	REL	RES	EMP	AS
CS	3.748	1.068	1						
CL	3.652	0.960	0.693**	1					
FLe	3.603	0.930	0.579**	0.573**	1				
REL	3.524	0.948	0.595**	0.591**	0.641**	1			
RES	3.482	0.977	0.624**	0.661**	0.639**	0.671**	1		
EMP	3.576	0.966	0.611**	0.627**	0.636**	0.634**	0.691**	1	
AS	3.710	0.972	0.698**	0.683**	0.622**	0.676**	0.659**	0.679**	1

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

Table 1 shows that flexibility is positively correlated to customer satisfaction. It indicates that higher the level of flexibility in the bank services, higher would be the customer satisfaction. The result also shows that the reliability is positively correlated to customer satisfaction. It indicates that higher level of reliability in the bank services leads to increase in customer satisfaction. Similarly, responsiveness has a positive relationship with customer satisfaction indicating better and quick response of the employees leads to increase in customer satisfaction. The result also shows that empathy has a positive relationship with customer satisfaction. It means that higher the level of empathy, higher would be the customer satisfaction. Likewise, assurance has a positive relationship with customer satisfaction. It means that better assurance of the services in banks leads to increase in customer satisfaction.

The result also shows that flexibility has a positive relationship with customer loyalty. It indicates that higher the level of flexibility in the bank services, higher would be the customer loyalty. Similarly, reliability has a positive relationship with customer loyalty. It indicates that higher level of

reliability in the bank services leads to increase in customer loyalty. Moreover, responsiveness has a positive relationship with customer loyalty indicating better and quick response of the employees leads to increase in customer loyalty. The result also shows that empathy has a positive relationship with customer loyalty. It means that higher the level of empathy, higher would be the customer loyalty. Likewise, assurance has a positive relationship with customer loyalty. It means that better assurance of the services in banks leads to increase in customer loyalty.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and results are presented in Table 2 and Table 3. More specifically, Table 2 shows the regression results of flexibility, reliability, responsiveness, empathy and assurance on customer satisfaction in Nepalese commercial banks.

Table 2

Estimated regression results of flexibility, reliability, responsiveness, empathy and assurance on customer satisfaction in Nepalese commercial banks

The results are based on 122 observations from sample commercial banks by using linear regression model. The model is $CS = \beta_0 + \beta_1 FLE + \beta_2 REL + \beta_3 RES + \beta_4 AS + \beta_5 EMP + e$ where, the dependent variable is CS (Customer satisfaction). The independent variables are FLE (Flexibility), REL (Reliability), RES (Responsiveness), AS (Assurance) and EMP (Empathy).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		F	R	RE	E	A			
1	0.577 (2.299)*	0.880 (13.045)**					0.595	0.688	170.165
2	0.514 (2.354)**		0.918 (15.347)**				0.662	0.621	235.523
3	0.675 (3.163)**			0.883 (14.969)**			0.650	0.631	224.082
4	0.569 (2.553)**				0.889 (14.789)**		0.645	0.636	218.728
5	0.204 (1.070)					0.955 (19.236)**	0.755	0.529	370.027
6	0.289 (1.288)	0.321 (2.955)**	0.653 (6.113)**				0.682	0.602	129.776
7	0.203 (0.954)	0.194 (1.798)	0.409 (3.467)**	0.403 (3.951)**			0.717	0.568	102.432
8	0.133 (0.635)	0.122 (1.115)	0.354 (3.008)**	0.264 (2.307)*	0.283 (2.518)**		0.730	0.555	81.918
9	-0.029 (0.152)	0.104 (1.059)	0.110 (0.961)	0.222 (2.165)*	0.015 (0.138)	0.589 (5.403)**	0.782	0.498	87.304

Notes:

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

The result shows that the beta coefficients for flexibility are positive with customer satisfaction. It implies that flexibility has positive impact on customer satisfaction. This finding is consistent with the findings of De Grahl et al. (2012). Similarly, the beta coefficients for reliability are positive with customer satisfaction. It implies that the reliability has positive relationship with customer satisfaction. This finding is similar to the findings of Ariff et al. (2013). In addition, the beta coefficients for responsiveness are positive with customer satisfaction. It implies that responsiveness has positive impact on customer satisfaction. This finding is consistent with the findings of Khan and Fasih (2014). Moreover, the beta coefficients for empathy are positive with customer satisfaction. It implies that the empathy has positive relationship with customer satisfaction. This finding is similar to the findings of

Hennig-Thurau (2004). Furthermore, the beta coefficients for assurance are positive with customer satisfaction. It implies that the assurance has positive impact on customer satisfaction. This finding is consistent with the findings of Kheng et al. (2010).

Table 3 shows the regression results of flexibility, reliability, responsiveness, empathy and assurance on customer loyalty in Nepalese commercial banks.

Table 3

Estimated regression results of flexibility, reliability, responsiveness, empathy and assurance on customer loyalty in Nepalese commercial banks

The results are based on 122 observations from sample commercial banks by using linear regression model. The model is $CL = \beta_0 + \beta_1 FLE + \beta_2 REL + \beta_3 RES + \beta_4 AS + \beta_5 EMP + e$ where, the dependent variable is CL (Customer loyalty). The independent variables are FLE (Flexibility), REL (Reliability), RES (Responsiveness), AS (Assurance) and EMP (Empathy).

Model	Intercept	Regression coefficients of					Adj. R ²	SEE	F-value
		FLE	REL	RES	EMP	AS			
1	0.890 (3.777)**	0.282 (2.698)**					0.548	0.645	146.554
2	0.837 (4.019)**		0.799 (13.995)**				0.619	0.593	195.865
3	0.874 (4.599)**			0.798 (15.191)**			0.657	0.562	230.771
4	0.780 (3.924)**				0.803 (14.977)**		0.650	0.568	224.312
5	0.508 (2.846)**					0.848 (18.218)**	0.734	0.495	331.901
6	0.640 (2.969)**	0.282 (2.698)**	0.567 (5.527)**				0.638	0.578	106.743
7	0.542 (2.727)**	0.136 (1.351)	0.289 (2.620)**	0.461 (4.835)**			0.696	0.530	92.452
8	0.465 (2.398)*	0.057 (0.562)	0.289 (2.620)**	0.307 (2.908)**	0.312 (3.005)**		0.715	0.512	76.357
9	0.323 (1.809)	0.041 (0.446)	0.014 (0.128)	0.271 (2.819)**	0.077 (0.734)	0.517 (5.073)**	0.765	0.465	79.257

Notes:

- Figures in parentheses are t-values.
- The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively.
- Dependent variable is the customer loyalty.

The result shows that the beta coefficients for flexibility are positive with customer loyalty. It implies that flexibility has positive impact on customer loyalty. This finding is consistent with the findings of Loonam and O'Loughlin (2008). Similarly, the beta coefficients for reliability are positive with customer loyalty. It implies that the reliability has positive relationship with customer loyalty. This finding is similar to the findings of Coelho and Henseler (2012). In addition, the beta coefficients for responsiveness are positive with customer loyalty. It implies that responsiveness has positive impact on customer loyalty. This finding is consistent with the findings of Ndubisi (2006). Moreover, the beta coefficients for empathy are positive with customer loyalty. It implies that the empathy has positive relationship with customer loyalty. This finding is similar to the findings of Mahmood et al. (2018). Furthermore, the beta coefficients for assurance are positive with customer loyalty. It implies that the assurance has positive impact on customer loyalty. This finding is consistent with the findings of Joseph et al. (2005).

4. Summary and conclusion

In this competitive era, it has become a prerequisite for the financial firms providing banking services to understand and meet the customers' needs and demands to remain competitive in today's

market environment. Without satisfying the customers, banking business cannot stand alone. To satisfy customers, it is often recommended to provide better quality banking services to the bank customers. Providing quality banking services has become a prime strategic tool for the banking sector nowadays.

This study attempts to analyse the impact of service quality dimensions on customer satisfaction and loyalty in Nepalese commercial banks. The study is based on primary data with 122 respondents.

The major conclusion of study is that flexibility, reliability, responsiveness, empathy and assurance have positive effect on customer satisfaction and loyalty in the context of Nepalese commercial banks. The study also showed that responsiveness ensures that customer queries and issues are addressed promptly and effectively, enhancing the overall customer experience and encouraging repeat business. Empathy, by demonstrating genuine concern for customer well-being and understanding their unique circumstances, strengthens emotional bonds and fosters long-term relationships. Assurance, through demonstrated competence and integrity, instills trust and reduces perceived risk, further solidifying customer loyalty. The study also concluded that these factors create a robust framework for delivering exceptional service in Nepalese commercial banks, driving customer satisfaction and loyalty, and ultimately contributing to sustained business success.

References

- Al-Slehat, Z. A. F., 2021. Determining the effect of banking service quality on customer loyalty using customer satisfaction as a mediating variable: An applied study on the Jordanian commercial banking sector. *International Business Research* 14(4), 1-58.
- Ariff, M. S. M., L. O. Yun, N. Zakuan, and K. Ismail, 2013. The impacts of service quality and customer satisfaction on customer loyalty in internet banking. *Procedia Social and Behavioral Sciences* 81(1), 469-473.
- Assegaff, S., 2016. The effect of service quality to customer satisfaction by using internet banking service in Jambi. *The Asian Journal of Technology Management* 9(1), 21-36.
- Ayer, R., 2023. E-banking services and its impact on customer satisfaction in Nepalese Commercial Banks. *Perspectives in Nepalese Management* 1(1), 289-300.
- Ayinaddis, S. G., 2023. The relationship between service innovation, customer satisfaction, and loyalty intention in emerging economies: Evidence from Ethio Telecom. *Journal of the Knowledge Economy* 14(4), 4045-4063.
- Berry, L. L., and A. Parasuraman, 2004. *Marketing Services: Competing Through Quality* (Simon and Schuster, New York).
- Bist, B., 2020. Perceived banking security and customer satisfaction in Nepalese commercial banks. *Nepalese Journal of Business* 7(3), 93-104.
- Coelho, P. S., and J. Henseler, 2012. Creating customer loyalty through service customization. *European Journal of Marketing* 46(3/4), 331-356.
- De Grahl, A., E. Hartmann, and A. De Grahl, 2012. *Success Factors in Logistics Outsourcing* (Springer Gabler, Wiesbaden).
- Etale, L. M., and P. Akpi, 2022. Service innovation and customer satisfaction nexus of the transportation sector of Yenagoa, Bayelsa State. *European Journal of Logistics, Purchasing and Supply Chain Management* 10(1), 15-23.
- Flint, D. J., C. P. Blocker, and P. J. Boutin, 2011. Customer value anticipation, customer satisfaction and loyalty: An empirical examination. *Industrial Marketing Management* 40(2), 219-230.
- Goel, M., M. D. Sharma, S. Dhamija, and N. Sharma, 2023. Literature review: service quality dimensions in Indian

- rural banking. *Journal of the Maharaja Sayajirao University of Baroda*, 57(1), 48-54.
- Gutek, B. A., M. Groth, and B. Cherry, 2002. Achieving service success through relationships and enhanced encounters. *Academy of Management Perspectives* 16(4), 132-144.
- Hennig-Thurau, T., K. P. Gwinner, and D. D. Gremler, 2002. Understanding relationship marketing outcomes: An integration of relational benefits and relationship quality. *Journal of Service Research* 4(3), 230-247.
- Hu, H. H., J. Kandampully, and T. D. Juwaheer, 2009. Relationships and impacts of service quality, perceived value, customer satisfaction, and image: an empirical study. *The Service Industries Journal* 29(2), 111-125.
- Iglesias, M. P., and M. J. Y. Guillen, 2004. Perceived quality and price: their impact on the satisfaction of restaurant customers. *International Journal of Contemporary Hospitality Management* 16(6), 373-379.
- Inuwa, M. L., and F. Igbadumhe, 2023. *Sustainability, Economics, Innovation, Globalisation and Organisational Psychology* (Springer Nature Singapore, Singapore).
- Joseph, M., Y. Sekhon, G. Stone, and J. Tinson, 2005. An exploratory study on the use of banking technology in the UK: A ranking of importance of selected technology on consumer perception of service delivery performance. *International Journal of Bank Marketing* 23(5), 397-413.
- Khan, M. M., and M. Fasih, 2014. Impact of service quality on customer satisfaction and customer loyalty: Evidence from banking sector. *Pakistan Journal of Commerce and Social Sciences* 8(2), 331-354.
- Kheng, L. L., O. Mahamad, and T. Ramayah, 2010. The impact of service quality on customer loyalty: A study of banks in Penang, Malaysia. *International Journal of Marketing Studies* 2(2), 57-66.
- Loonam, M., and D. O'Loughlin, 2008. Exploring e-service quality: a study of Irish online banking. *Marketing Intelligence and Planning* 26(7), 759-780.
- Mahmood, A., M. L. T. Rana, and S. Kanwal, 2018. Relationship between service quality, customer loyalty and customer satisfaction. *Lahore Journal of Business* 6(2), 135-154.
- Mohapatra, S., A. Kumar, T. Shirmila, A. D. Rroy, and S. L. Hota, 2024. The mediating role of customer satisfaction for a sustainable e-banking performance. *Environment and Social Psychology* 9(6), 1-11.
- Ndubisi, N. O., 2006. A structural equation modelling of the antecedents of relationship quality in the Malaysia banking sector. *Journal of Financial Services Marketing* 11(2), 131-141.
- Nguyen, D. T., V. T. Pham, D. M. Tran, and D. B. T. Pham, 2020. Impact of service quality, customer satisfaction and switching costs on customer loyalty. *The Journal of Asian Finance, Economics and Business* 7(8), 395-405.
- Obananya, C. G., 2020. Service quality and customers loyalty in Nigerian Commercial Banking Industry. *International Journal of Innovative, Finance and Economics Research* 8(4), 1-12.
- Pathak, K., J. Chataut, K. Adhikari, and J. Chand, 2022. Impact of internet banking service quality on customer satisfaction of Nepalese commercial banks. *Nepalese Journal of Economic* 6(1), 135-147.
- Paul, J., A. Mittal, and G. Srivastav, 2016. Impact of service quality on customer satisfaction in private and public sector banks. *International Journal of Bank Marketing* 34(5), 606-622.
- Powers, T. L., and E. P. Jack, 2008. Using volume flexible strategies to improve customer satisfaction and performance in health care services. *Journal of Services Marketing* 22(3), 188-197.
- Wong, A., and A. S. Sohal, 2006. Understanding the quality of relationships in consumer services: A study in a retail environment. *International Journal of Quality and Reliability Management* 23(3), 244-264.

Chapter 21

Impact of Behavioral Biases on Investment Decision and Strategies of Investors in Nepal Stock Exchange

Jharana Regmi*

Abstract

The study examines the impact of behavioral biases on investment decision and strategies of investors in Nepal Stock Exchange. Trading frequency and portfolio diversification are selected as the dependent variables. The selected independent variables are regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias. The study is based on primary data with 121 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 behavioral biases on investment decision and strategies of investors in Nepal Stock Exchange.

The study showed that regret aversion has a positive effect on trading frequency and portfolio diversification. It indicates that increase in regret aversion bias leads to increase in trading frequency and portfolio diversification among investors. Similarly, representativeness bias has a positive effect on trading frequency and portfolio diversification. It indicates that increase in representativeness bias leads to increase in trading frequency and portfolio diversification among investors. Moreover, overconfidence bias has a positive effect on trading frequency and portfolio diversification. It indicates that increase in overconfidence in an investor leads to increase in trading frequency and portfolio diversification. Likewise, herd mentality has a positive effect on trading frequency and portfolio diversification. It indicates that increase in herd mentality in investors leads to increase in trading frequency and portfolio diversification. In addition, familiarity has a positive effect on trading frequency and portfolio diversification. It indicates that investors with high familiarity bias leads to increase in trading frequency and portfolio diversification. Furthermore, disposition bias has a positive effect on trading frequency and portfolio diversification. It indicates that higher disposition bias leads to increase in trading frequency and portfolio diversification.

Keywords: regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, disposition effect bias

1. Introduction

Behavioral finance is a relatively new field that integrates behavioral and psychological theories with traditional economic and financial theories to explain why people make irrational financial decisions. This concept is widely recognized in the stock market and investment options globally. Behavioral finance examines how psychology and sociology influence the behavior of financial practitioners. It is crucial to understand why individuals buy or sell stocks without conducting basic research or act irrationally when making investment decisions (Sendilvelu and Shah, 2021). Financial investment has become an emerging trend over the past few decades, as investors increasingly make decisions not only based on their unbiased behavior but also on future predictions. Rational investors strive to make careful and economically feasible decisions every time they invest (Iram et al., 2020). Behavioral biases significantly impact investment decisions, often leading individuals to make irrational choices. Understanding these biases can help investors recognize and mitigate their effects, leading to more rational and effective decision-making.

* Ms. Regmi is a Freelance Researcher, Kathmandu, Nepal.

Shah and Malik (2021) investigated the role of regret aversion and loss aversion emotional biases in determining individual investors' trading frequency in the context of the Pakistan Stock Exchange (PSX). The results depicted that regret aversion and loss aversion have statistically significant and negative impacts on individual investors' trading frequency. Nurudina et al. (2020) described the influence of regret aversion bias and risk tolerance on West Java young investors through investment decisions partially and simultaneously. The correlation between the independent variables was found to be a strong and unidirectional correlation between regret aversion bias and risk tolerance. This shows that regret aversion can create risk tolerance among young West Java investors. There is a simultaneous influence of regret aversion bias and risk tolerance on investment decisions among young investors in West Java. This shows that regret aversion bias and risk tolerance together have an influence on the investment decisions of young investors in West Java. Wardani and Lutfi (2017) analyzed the effect of financial literacy, experienced regret, risk tolerance, and motivation on family investment decisions by taking samples of 105 Balinese residents. The investment decision investigated in this study is dealt with the decision to invest the money in capital market instruments and bank accounts. The results of this study indicate that risk tolerance has positive influence on investment decisions of Balinese family. Meanwhile, financial literacy, experienced regret, and motivation do not affect significantly investment decisions of Balinese family. These results imply that Balinese people consider their risk tolerance as the main factor considered in making decision whether to put the money in bank accounts or capital market instruments.

Zhdanov and Simonov (2021) analyzed the influence of familiarity bias on respondents' decision-making process, using results from online experiments. The study showed that familiarity bias significantly influences individual investors' decision-making processes, leading to different behaviors such as being more persistent in selling winners, holding losers, and buying fallen assets. The study also confirmed that familiarity bias directly impacts three investor sentiment anomalies: loss aversion, buying preferences, and risk-seeking trading. The experimental approach used in the study sheds light on how familiarity bias affects investor behavior in various aspects of decision-making. Riff and Yagil (2016) investigated the role of behavioral factors on the home bias phenomenon, focusing on the impact of location, familiarity and fluency. The results showed that the participants were willing to take more risk when the asset was local. Moreover, the results indicate that the participants are willing to take more risk with familiar assets than with unfamiliar assets. Investors' tendency toward home bias increases during bear periods or financial crises and this will increase the deviation from the optimal portfolio allocation. Seetharaman et al. (2017) investigated the factors that determine the investment portfolio of individual investors in Singapore. The study showed that financial knowledge or understanding about a particular investment product has a significant impact on an investor's behaviour. The findings also showed that the investment objective and asset familiarity exert an impact on investor behaviour, with asset familiarity having the strongest impact. Investor behaviour, in turn, influences the choice of a portfolio of the investors. The study further concluded that the investment objective and asset familiarity play a vital role in the choice of the portfolio. This shows that asset familiarity introduces the bias and creates the confidence that the returns are guaranteed.

Paul and Sundaram (2023) showed that institutional investors are more inclined to herd than individual investors. Likewise, Qasim et al. (2019) assessed the impact of herding behavior and overconfidence biases on the investors' decision-making in Pakistan. The relationships between investors' decision-making and herding behavior as well as overconfidence biases were empirically tested using Ordinary Least Square (OLS) method. The results showed that Pakistani investors' decisions were significantly influenced by both herding behavior and overconfidence biases. Armansyah (2022) attempted to fill a knowledge gap in behavioral finance by concentrating on behavioral biases such as Herd Instinct Bias, Emotional Biases, and Information Processing Biases in capital market investment

decisions. Using PLS-SEM (Partial Least Square-Structural Equation Modeling), the study showed that there is a significant effect of herding bias on investment decisions. Similarly, there is a significant and positive influence between herding bias on investment decisions. Thus, investors tend to follow the decisions of other investors without using fundamental or technical analysis, influencing decision making in capital market investment. Moreover, the results confirmed that overconfidence, herding bias, confirmation bias, and recency bias influence investor investment decisions, whereas endowment bias had no effect on investment decisions.

In the context of Nepal, Shrestha (2024) analyzed the perception of investor on the selected behavioral factors that makes influence on individual investor's investment decisions at Nepalese stock market. Using the structured survey questionnaire, the study concluded that behavioral factors have significant influence on investment decision of individual investor. The study also revealed that past trends of stock, information of dividend, price level of other stock, and information of the stock market are the major market information factors for influencing investment decision of individual investor at Nepalese stock market. Dhakal and Lamsal (2023) examined the impact of cognitive biases on the investment decisions of Nepalese stock market investors using a self-administered questionnaire as the primary data collection method. The study found that representativeness bias had the strongest effect on investment decision-making, followed by herding and anchoring biases. The results suggest that cognitive biases can significantly affect the investment decisions of Nepalese investors and may have negative consequences for their investment outcomes.

Dhungana et al. (2022) examined the effect of cognitive biases on investment decisions in Pokhara Valley, Nepal. The study discovered a link between irrationality in financial decision-making and availability, overconfidence, and herd instinct biases, but anchoring and regret aversion biases had no effect on irrational investment decisions. However, though all the biases have a positive relationship with an irrational investment decision, overconfidence bias has the highest impact. Regret aversion bias has the least impact on investment decisions in comparison to the other four biases. Poudel et al. (2024) examined the impact of behavioral biases, such as overconfidence, disposition effect, herding, risk aversion, and financial literacy, on investment decision making. The findings of the study showed that overconfidence, disposition effect, and risk aversion have a significant positive impact on investment decision making, while herding does not have a significant effect. Karmacharya et al. (2022) explored whether the perceived behavioral factors impelling specific investors' decision-making to contribute to the Nepal Stock Exchange (NEPSE) performance. Applying structural model analysis of the data, the results showed that among the four behavioral variables, market, heuristic, and herding factors have significant effects on investment performance. The study observed more reliance and dependence of investors on market information and sentiments. The study suggests that investors consider the fundamentals of the stock and consider the investors' behavior to get a return from the market. Moreover, the prospect variable (loss aversion, framing effects) does not have a significant impact on investment performance.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of behavioral biases on investment decision and strategies of investors. 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 behavioral biases on investment decision and strategies of investors in Nepal Stock Exchange. Specifically, it examines the relationship of regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias,

and disposition effect bias with trading frequency and portfolio diversification of investors in Nepal Stock Exchange.

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 121 respondents through questionnaire. The study is based on convenience sampling method. The respondents' views were collected on regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that the investment decision and strategies of investors depends upon behavioral biases. The dependent variables selected for the study are trading frequency and portfolio diversification. Similarly, the selected independent variables are regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias. Therefore, the models take the following forms.

$$TF = \beta_0 + \beta_1 RAB + \beta_2 REB + \beta_3 OB + \beta_4 HM + \beta_5 FB + \beta_6 DB + \epsilon$$

$$PD = \beta_0 + \beta_1 RAB + \beta_2 REB + \beta_3 OB + \beta_4 HM + \beta_5 FB + \beta_6 DB + \epsilon$$

Where,

TF = Trading frequency

PD = Portfolio diversification

RAB = Regret aversion bias

REB = Representativeness bias

OB = Overconfidence bias

HM = Herd mentality

FB = Familiarity bias

DB = Disposition effect bias

Trading frequency 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 typically hold onto an investment for more than a year before selling it", "Even if an investment shows potential for future growth, I tend to sell it quickly if its value starts to decline" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.783$).

Portfolio diversification 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 "Diversifying my investments across different asset classes is crucial

for managing risk”, “I am comfortable with the current level of risk associated with my investment portfolio allocation” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.891$).

Regret aversion bias 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 avoid making investment decisions because I’m worried about making the wrong choice and regretting it later”, “When presented with two investment options with similar expected returns, I would likely choose the one with a guaranteed return, even if it meant a slightly lower potential gain” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.873$).

Representativeness bias 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 “If a particular stock has performed well recently, I’m more likely to believe it will continue to perform well in the future, even if market conditions change”, “When evaluating a new investment opportunity, I tend to focus on its similarities to past successful investments, even if the underlying factors might be different” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.868$).

Overconfidence bias 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 very confident in my ability to choose winning investments, even compared to professional financial advisors”, “I believe I have a superior understanding of the stock market compared to most other investors, allowing me to consistently outperform the market average” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.893$).

Herd mentality 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 invest in a company if I see a lot of other people are also investing in it, even if I don’t fully understand the company’s business model”, “When making investment decisions, I consider what popular financial bloggers and social media influencers are recommending, even if they don’t align with my own risk tolerance or investment goals” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.892$).

Familiarity bias 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 tend to stick with the same investments year after year, even if there are new investment opportunities that seem potentially more profitable”, “I am hesitant to invest in companies with complex business models or financial structures because I don’t fully understand them” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.874$).

Disposition effect bias 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 investment decisions are influenced by emotional attachment to certain stocks, even if it’s not a rational financial choice”, “I find it difficult to sell an investment that has performed well in the past, even if market conditions suggest it might decline in value” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.875$).

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

Regret aversion bias

Regret aversion bias is the tendency to avoid taking action because of the fear of experiencing regret from making a wrong decision. This bias often results in indecision or overly conservative choices, as individuals aim to avoid the emotional pain associated with potential losses (Bell, 1982). Investors tend to feel more regret over losses than satisfaction over gains of equal magnitude, influencing their risk perceptions and investment decisions (Kahneman and Tversky, 1974). Investors may avoid selling losing investments to avoid the regret of realizing a loss or may shy away from buying potentially profitable but risky assets to avoid the regret of a possible future decline (Barberis and Thaler, 2003). Dhar and Zhu (2006) revealed that regret aversion can lead to lower trading frequencies, as investors avoid making decisions that could lead to regrettable outcomes. Incorporating regret aversion into portfolio optimization can lead to changes in optimal portfolio weights, potentially resulting in higher allocations to inefficient and risky assets. Based on it, this study develops the following hypothesis:

H₁: There is a negative relationship between regret aversion bias and investment decision and strategies of investors.

Representativeness bias

Representativeness bias is a cognitive (behavioral) bias where individuals make decisions based on how similar or typical an event or decision seems to an existing stereotype or model, rather than considering base rates or probabilities objectively (Chen et al., 2007). This bias leads individual to overestimate the likelihood of an outcome based on how closely it resembles their expectations or a prototype they have in mind, regardless of statistical probabilities or objective data (Kahneman and Tversky, 1974). Representativeness bias can hinder effective portfolio diversification by causing investors to disproportionately allocate capital to familiar or recent winners, neglecting opportunities in undervalued assets or new market developments (Kahneman and Lovallo, 1993). Adiputra (2021) found that investors in the Islamabad Stock Exchange often use past performance as a representation of future performance, leading to biased decisions. This was further supported by Salman et al. (2020), who identified a mediating role of risk tolerance in the relationship between heuristic representativeness bias and investment decision making in the Pakistan Stock Exchange. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between representativeness bias and investment decision and strategies of investors.

Overconfidence bias

Overconfidence bias explains how individuals tend to have unwarranted faith in their judgments, despite evidence suggesting otherwise. It suggests that people often believe they are more knowledgeable or skillful than they actually are, which can lead to suboptimal decision-making (Lichtenstein and Fischhoff, 1977). Overconfidence bias can lead investors to underestimate risks and overestimate potential returns. It may cause them to trade more frequently, make speculative investments, or fail to adequately diversify their portfolios, based on the belief that they possess superior insights (Barber and Odean, 2001). Overconfident traders tend to have higher trading costs and lower returns due to excessive trading and lower investment performance compared to their more cautious counterparts (Odean, 1999). Overconfidence bias can lead investors to engage in speculative behaviors, such as day trading or stock picking based on incomplete information or unreliable forecasts (Gervais and Odean, 2001). Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between overconfidence bias and investment decision and strategies of investors.

Herd mentality

Herd mentality is rooted in social psychology and behavioral economics, explaining how individuals seek safety and reassurance in conformity with group actions, even if those actions are not based on rational assessment (Banerjee, 1992). This phenomenon suggests that people may imitate others' behaviors out of fear of missing out or uncertainty. This behavior often results in overvalued or undervalued assets, driven more by emotional responses and social influence than by fundamental analysis (Shiller, 2015). Herd behavior can amplify market swings and lead to suboptimal investment outcomes for individuals and the broader market (Devenow and Welch, 1996). Herding behavior can be seen, mostly when the stock market is falling because investors will flock to sell shares simultaneously for fear of losing their capital and vice versa when the market is rising. Herding bias, a form of cognitive bias, can significantly impact investment decisions, trading frequency, and portfolio diversification. This bias can lead to non-optimal portfolio choices, reduce the quality of investment decisions, and increase the benefits of the investment process (Dang and Lin, 2016). Based on it, this study develops the following hypothesis:

H₄: There is a negative relationship between herd mentality and investment decision and strategies of investors.

Familiarity bias

Familiarity bias suggests that investors tend to overweight or prefer investments in companies or industries they know well, often leading to concentrated portfolios that lack diversification (Hong and Kacperczyk, 2009). Investors influenced by familiarity bias may overlook potential risks or fail to capitalize on new investment opportunities (Shefrin and Statman, 1994). Familiarity bias can result in suboptimal portfolio diversification and missed opportunities for higher returns. Investors may ignore fundamental analysis or market trends in favor of familiarity, which can lead to undiversified portfolios vulnerable to sector-specific risks (Barber and Odean, 2001). Familiarity bias contributes to portfolio concentration and can lead to lower returns compared to well-diversified portfolios (Huberman, 2001). Investors often exhibit a preference for local stocks or industries they are familiar with, which may result in missed opportunities in global markets or emerging sectors (Grinblatt and Keloharju, 2001). Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between familiarity bias and investment decision and strategies of investors.

Disposition effect bias

The disposition effect refers to the asymmetric behavior of investors in realizing gains and losses. Investors are more likely to sell winning investments quickly to lock in gains (seeking pride) and hold onto losing investments in the hope of recovering losses (avoiding regret). Verma (2016) found that regret plays a significant role in this behavior, with investors regretting holding on to losing stocks more than selling winning stocks too soon. Madaan and Singh (2019) further demonstrated that people tend to tolerate more losses than they initially set out to, and this is particularly pronounced in women. The disposition effect can undermine effective risk management strategies by encouraging investors to hold onto declining assets, increasing portfolio risk. Investors may fail to rebalance portfolios or reallocate assets based on objective market conditions (Barber and Odean, 2001). Investors' tendency to realize gains quickly and hold onto losses can result in reduced returns compared to a more rational, long-term

approach. Over time, disposition bias can lead to lower overall returns and missed opportunities for capital growth (Shefrin and Statman, 1994). Based on it, this study develops the following hypothesis:

H_6 : There is a negative relationship between disposition bias and investment decision and strategies of investors.

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 121 observations. The dependent variables are TF (Trading frequency) and PD (Portfolio diversification). The independent variables are RAB (Regret aversion bias), REB (Representativeness bias), OB (overconfidence bias), HM (Herd mentality), FB (Familiarity Bias), and DB (Disposition effect bias).

Variables	Mean	S.D.	TF	PD	RAB	REB	OB	HM	FB	DB
TF	3.623	0.816	1							
PD	3.948	0.835	0.529**	1						
RAB	3.624	0.938	0.437**	0.292**	1					
REB	3.606	0.894	0.490**	0.518**	0.481**	1				
OB	3.166	0.929	0.338**	0.324**	0.075	0.357**	1			
HM	3.304	0.980	0.434**	0.407**	0.490**	0.561**	0.289**	1		
FB	3.606	0.910	0.542**	0.475**	0.431**	0.494**	0.265**	0.562**	1	
DB	3.555	0.918	0.547**	0.450**	0.485**	0.519**	0.341**	0.507**	0.538**	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 for dependent and independent variables. The study shows that regret aversion is positively correlated to trading frequency. It indicates that increase in regret aversion bias leads to increase in trading frequency among investors. Similarly, representativeness bias has a positive relationship with trading frequency. It indicates that increase in representativeness bias leads to increase in trading frequency among investors. Moreover, overconfidence bias has a positive relationship with trading frequency. It indicates that increase in overconfidence in an investor leads to increase in trading frequency. Further, herd mentality is positively correlated to trading frequency. It indicates that increase in herd mentality in investors leads to increase in trading frequency. In addition, familiarity is positively correlated to trading frequency. It indicates that investors with high familiarity bias leads to increase in trading frequency. In addition, disposition bias is positively correlated to trading frequency. It indicates that higher disposition bias leads to increase in trading frequency.

In addition, the study shows that regret aversion is positively correlated to portfolio diversification. It indicates that increase in regret aversion bias leads to increase in portfolio diversification among investors. Similarly, representativeness bias has a positive relationship with portfolio diversification. It indicates that increase in representativeness bias leads to increase in

portfolio diversification among investors. Moreover, overconfidence bias has a positive relationship with portfolio diversification. It indicates that increase in overconfidence in an investor leads to increase in portfolio diversification. Further, herd mentality is positively correlated to portfolio diversification. It indicates that increase in herd mentality in investors leads to increase in portfolio diversification. In addition, familiarity is positively correlated to portfolio diversification. It indicates that investors with high familiarity bias leads to increase in portfolio diversification. In addition, disposition bias is positively correlated to portfolio diversification. It indicates that higher disposition bias leads to increase in portfolio diversification.

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 and Table 3. More specifically, Table 2 shows the regression results of regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias on trading frequency in Nepal Stock Exchange.

Table 2

Estimated regression results of regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias on trading frequency

The results are based on 121 observations using linear regression model. The model is $TF = \beta_0 + \beta_1 RAB + \beta_2 REB + \beta_3 OB + \beta_4 HM + \beta_5 FB + \beta_6 DB + \varepsilon$ where the dependent variable is TF (Trading frequency). The independent variables are RAB (Regret aversion bias), REB (Representativeness bias), OB (overconfidence bias), HM (Herd mentality), FB (Familiarity Bias), and DB (Disposition effect bias).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		RAB	REB	OB	HM	FB	DB			
1	1.834 (7.465)**	0.494 (7.517)**						0.316	0.674	56.508
2	1.419 (6.153)**		0.611 (9.840)**					0.444	0.608	96.833
3	2.184 (9.614)**			0.454 (6.596)**				0.262	0.700	43.506
4	2.051 (9.51)**				0.476 (7.599)**			0.321	0.672	57.740
5	1.376 (6.261)**					0.623 (10.538)**		0.478	0.589	111.049
6	1.325 (6.464)**						0.646 (11.572)**	0.526	0.561	133.919
7	1.14 (4.703)**	0.216 (2.97)**	0.471 (6.161)**					0.478	0.589	56.009
8	0.65 (2.612)**	0.297 (4.254)**	0.273 (3.282)**	0.288 (4.540)**				0.553	0.545	50.415
9	0.653 (2.603)**	0.293 (3.828)**	0.268 (2.939)**	0.287 (4.403)**	0.010 (0.131)			0.549	0.547	37.498
10	0.338 (1.442)	0.241 (3.444)**	0.195 (2.332)*	0.269 (4.561)**	0.175 (2.167)*	0.399 (5.205)**		0.632	0.494	42.164
11	0.358 (1.578)	0.165 (2.289)**	0.155 (1.886)	0.215 (3.594)**	1.86 (2.376)*	0.329 (4.237)**	0.240 (2.964)**	0.655	0.479	38.980

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.
- Trading frequency is the dependent variable.

The regression results show that the beta coefficients for regret aversion bias are positive with trading frequency. It indicates that regret aversion bias has a positive impact on trading frequency. This finding is consistent with the findings of Dhar and Zhu (2006). Similarly, the regression result shows

that the beta coefficients for representativeness bias are positive with trading frequency. It indicates that representativeness bias has a positive impact on trading frequency. This finding is similar to the findings of Adiputra (2021). Moreover, the beta coefficients for overconfidence bias are positive with trading frequency. It indicates that overconfidence bias has a positive impact on trading frequency. This finding is consistent with the findings of Odean (1999). In addition, the beta coefficients for herd mentality are positive with trading frequency. It indicates that herd mentality has positive impact on trading frequency. This finding is similar to the findings of Devenow and Welch (1996). Similarly, the beta coefficients for familiarity bias are positive with trading frequency. It indicates that familiarity bias has a positive impact on trading frequency. This finding is consistent with the findings of Grinblatt and Keloharju (2001). In addition, the beta coefficients for disposition effect bias are positive with trading frequency. It indicates that disposition effect bias has a positive impact on trading frequency. This finding is similar to the findings of Shefrin and Statman (1994).

Table 3 shows the regression results of regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias on portfolio diversification in Nepal Stock Exchange.

Table 3

Estimated regression results of regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias on portfolio diversification

The results are based on 121 observations using linear regression model. The model is $PD = \beta_0 + \beta_1 RAB + \beta_2 REB + \beta_3 OB + \beta_4 HM + \beta_5 FB + \beta_6 DB + \epsilon$ where the dependent variable is PD (Portfolio diversification). The independent variables are RAB (Regret aversion bias), REB (Representativeness bias), OB (overconfidence bias), HM (Herd mentality), FB (Familiarity Bias), and DB (Disposition effect bias).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		RAB	REB	OB	HM	FB	DB			
1	2.598 (9.358)**	0.372 (5.021)**						0.168	0.762	25.208
2	1.589 (6.993)**		0.654 (10.694)**					0.486	0.599	114.354
3	2.630 (10.909)**			0.416 (5.696)**				0.208	0.744	32.444
4	2.461 (20.763)**				0.450 (6.783)**			0.273	0.712	46.004
5	1.989 (7.879)**					0.543 (8.004)**		0.345	0.676	64.066
6	2.170 (8.486)**						0.500 (7.176)**	0.296	0.701	51.500
7	1.615 (6.525)**	0.020 (0.268)	0.667 (8.548)**					0.482	0.601	56.767
8	1.363 (5.04)**	0.021 (0.282)	0.667 (8.548)**	0.148 (2.149)*				0.497	0.592	40.545
9	1.369 (5.028)**	0.012 (0.141)	0.554 (5.591)**	0.144 (2.039)*	0.025 (0.289)			0.493	0.595	30.192
10	1.157 (4.247)**	0.023 (0.289)	0.505 (5.194)**	0.132 (1.930)	0.100 (1.061)	0.268 (3.015)*		0.526	0.575	27.656
11	1.158 (4.228)**	0.025 (0.289)	0.504 (5.09)**	0.131 (1.814)	0.100 (1.061)	0.267 (2.846)*	0.006 (0.057)	0.522	0.578	22.847

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.
- Portfolio diversification is the dependent variable.

The regression results show that the beta coefficients for regret aversion bias are positive with portfolio diversification. It indicates that regret aversion bias has a positive impact on portfolio

diversification. This finding is consistent with the findings of Bell (1982). Similarly, the regression result shows that the beta coefficients for representativeness bias are positive with portfolio diversification. It indicates that representativeness bias has a positive impact on portfolio diversification. This finding is similar to the findings of Salman et al. (2020). Moreover, the beta coefficients for overconfidence bias are positive with portfolio diversification. It indicates that overconfidence bias has a positive impact on portfolio diversification. This finding is consistent with the findings of Lichtenstein and Fischhoff (1977). In addition, the beta coefficients for herd mentality are positive with portfolio diversification. It indicates that herd mentality has positive impact on portfolio diversification. This finding is similar to the findings of Dang and Lin (2016). Similarly, the beta coefficients for familiarity bias are positive with portfolio diversification. It indicates that familiarity bias has a positive impact on portfolio diversification. This finding is consistent with the findings of Grinblatt and Keloharju (2001). In addition, the beta coefficients for disposition effect bias are positive with portfolio diversification. It indicates that disposition effect bias has a positive impact on portfolio diversification. This finding is similar to the findings of Madaan and Singh (2019).

4. Summary and conclusion

Behavioral biases significantly impact investment decisions, often leading individuals to make irrational choices. These biases, such as overconfidence, herding, and risk aversion, cause investors to deviate from logical and rational decision-making processes. For instance, overconfidence can lead to excessive trading, while herding behavior can result in following the crowd rather than making independent assessments. Recognizing these biases allows investors to be more aware of their own psychological tendencies, enabling them to implement strategies to counteract these biases. By doing so, they can make more informed, rational, and effective investment decisions, ultimately improving their financial outcomes.

This study attempts to examine the impact of behavioral biases on investment decision and strategies of investors in Nepal Stock Exchange. The study is based on primary data with 121 observations.

The major conclusion of the study is that regret aversion bias, representativeness bias, overconfidence bias, herd mentality, familiarity bias, and disposition effect bias on trading frequency and portfolio diversification in Nepal Stock Exchange. The presence of regret aversion, representativeness, overconfidence, herd mentality, familiarity, and disposition effect biases significantly increase trading frequency and positively impacts portfolio diversification in the Nepal Stock Exchange, leading investors to make frequent, impulsive trades and maintain diversified portfolios that are not vulnerable to market volatility and potential losses. The study determined that disposition effect bias is the most influencing factor that determines the changes in trading frequency in Nepal Stock Exchange. Similarly, the study also concluded that representativeness bias is the most influencing factor that determines the changes in portfolio diversification among investors in the context of Nepal Stock Exchange.

References

- Adiputra, I. G., 2021. The influence of overconfidence, representative bias, and risk tolerance in investment decision making: Evidence on stock investors in Indonesia. *Journal of Human University Natural Sciences* 48(4), 54-62.
- Armansyah, R. F., 2022. Herd instinct bias, emotional biases, and information processing biases in investment decisions. *Jurnal Manajemen dan Kewirausahaan* 24(2), 105-117.
- Banerjee, A. V., 1992. A simple model of herd behavior. *The Quarterly Journal of Economics* 107(3), 797-817.

- Barber, B. M., and T. Odean, 2001. The internet and the investor. *Journal of Economic Perspectives* 15(1), 41-54.
- Barberis, N., and R. Thaler, 2003. A survey of behavioral finance. *Handbook of the Economics of Finance* 1(1), 1053-1128.
- Bell, D. E., 1982. Regret in decision making under uncertainty. *Operations Research* 30(5), 961-981.
- Chen, G., K. A. Kim, J. R. Nofsinger, and O. M. Rui, 2007. Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors. *Journal of Behavioral Decision Making* 20(4), 425-451.
- Dang, H. V., and M. Lin, 2016. Herd mentality in the stock market: On the role of idiosyncratic participants with heterogeneous information. *International Review of Financial Analysis* 48(1), 247-260.
- Devenow, A., and I. Welch, 1996. Rational herding in financial economics. *European Economic Review* 40(5), 603-615.
- Dhakal, S., and R. Lamsal, 2023. Impact of cognitive biases on investment decisions of investors in Nepal. *The Lumbini Journal of Business and Economics* 11(1), 35-48.
- Dhar, R., and N. Zhu, 2006. Up close and personal: Investor sophistication and the disposition effect. *Management Science* 52(5), 726-740.
- Dhungana, B. R., S. Bhandari, D. Ojha, and L. K. Sharma, 2022. Effect of cognitive biases on investment decision making: A case of Pokhara valley, Nepal. *Quest Journal of Management and Social Sciences* 4(1), 71-84.
- Gervais, S., and T. Odean, 2001. Learning to be overconfident. *Review of Financial Studies* 14(1), 1-27.
- Grinblatt, M., and M. Keloharju, 2001. What makes investors trade? *Journal of Finance* 56(2), 589-616.
- Hong, H., and M. Kacperczyk, 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics* 93(1), 15-36.
- Huberman, G., 2001. Familiarity breeds investment. *Review of Financial Studies* 14(3), 659-680.
- Iram, T., A. R. Bilal, and K. Dost, 2020. Behavioral factors affecting the investment decision of an individual: A systematic review. *Journal of Xidian University* 14(8), 774-804.
- Kahneman, D., and A. Tversky, 1974. Judgment under uncertainty: Heuristics and biases. *Science* 185(1), 1124-1131.
- Kahneman, D., and D. Lovallo, 1993. Timid choices and bold forecasts: A cognitive perspective on risk taking. *Management Science* 39(1), 17-31.
- Karmacharya, B., R. Chapagain, B. R. Dhungana, and K. Singh, 2022. Effect of perceived behavioral factors on investors' investment decisions in stocks: Evidence from Nepal stock market. *Journal of Business and Management Research* 4(1), 17-33.
- Lichtenstein, S., and B. Fischhoff, 1977. Do those who know more also know more about how much they know? *Organizational Behavior and Human Performance* 20(2), 159-183.
- Madaan, G., and S. Singh, 2019. An analysis of behavioral biases in investment decision-making. *International Journal of Financial Research* 10(4), 55-67.
- Nurdinda, W., A. Muslihat, and R. A. K. Putra, 2020. Pengaruh Regret Aversion Bias dan Risk Tolerance Bagi Investor Muda Jawa Barat terhadap Keputusan Investasi. *AKUNSIKA: Jurnal Akuntansi dan Keuangan* 1(1), 30-38.
- Odean, T., 1999. Do investors trade too much? *American Economic Review* 89(5), 1279-1298.

- Paul, H. I. S., and Sundaram, N. (2023). Behavioral biases and their influence on investment decision-making: A systematic literature review and future research agenda. *Journal of Law and Sustainable Development* 11(4), 904-909.
- Poudel, A., S. Bhusal, and D. D. Pathak, 2024. Behaviour bias and investment decision in Nepalese investors. *International Journal of Business and Management* 19(2), 1-85.
- Qasim, M., R. Hussain, I. Mehboob, and M. Arshad, 2019. Impact of herding behavior and overconfidence bias on investors' decision-making in Pakistan. *Accounting* 5(2), 81-90.
- Riff, S., and Y. Yagil, 2016. Behavioral factors affecting the home bias phenomenon: Experimental tests. *Journal of Behavioral Finance* 17(3), 267-279.
- Salman, M., B. Khan, and A. Javed, 2020. Moderated mediation: The impact of heuristic representativeness bias on investment decision-making. *AJSS* 4(2), 354-363.
- Seetharaman, A., I. Niranjana, N. Patwa, and A. Kejriwal, 2017. A study of the factors affecting the choice of investment portfolio by individual investors in Singapore. *Accounting and Finance Research* 6(3), 153-168.
- Sendilvelu, K., and M. D. Shah, 2021. A study on impact of behavioral finance on investment decision of single parents in South Asian Countries. *International Journal of Accounting and Finance Review* 6(2), 16-37.
- Shah, I., and I. R. Malik, 2021. Role of regret aversion and loss aversion emotional biases in determining individual investors' trading frequency: moderating effects of risk perception. *Humanities and Social Sciences Reviews* 9(3), 1373-1386.
- Shefrin, H., and M. Statman, 1994. Behavioral capital asset pricing theory. *Journal of Financial and Quantitative Analysis* 29(3), 323-349.
- Shiller, R. J., 2015. *Irrational Exuberance* (Princeton University Press, New Jersey).
- Shrestha, P. M., 2024. Behavioral factors influencing investment decision of individual investor at Nepalese stock market. *Journal of Entrepreneurship and Management Studies* 1(1), 17-26.
- Verma, N., 2016. Impact of behavioral biases in investment decision and strategies. *Journal of Management Research and Analysis* 3(1), 28-30.
- Wardani, A. K., and L. Lutfi, 2017. Pengaruh literasi keuangan, experienced regret, risk tolerance, dan motivasi pada keputusan investasi keluarga dalam perspektif masyarakat Bali. *Journal of Business and Banking* 6(2), 195-214.
- Zhdanov, V., and A. Simonov, 2021. Sell winners and buy losers? The impact of familiarity on individual investors' decision-making: Experimental results. *International Journal of Financial Studies* 9(3), 47-54.

Chapter 22

Impact of Social Media Marketing on Consumer Buying Behavior in Nepalese Fashion Industry

Shreeshma Shikhrakar and Ramesh Rawat*

Abstract

This study examines the impact of social media marketing on consumer buying behavior in Nepalese fashion industry. Consumer buying behavior is the selected dependent variable. The selected independent variables are content quality, product quality, social media engagement, brand trust, advertisement frequency, and influencer endorsements. The primary source of data is used to assess the opinions of the respondents regarding content quality, product quality, social media engagement, brand trust, advertisement frequency, and influencer endorsements in the social media marketing. The study is based on primary data of 232 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 media marketing on consumer buying behavior in the Nepalese fashion industry.

The study showed that content quality has a positive effect on consumer buying behavior, indicating that better quality of fashion contents in social media platforms lead to enhanced consumer buying behavior. Similarly, product quality has a positive effect on consumer buying behavior. It implies that better quality of fashionable products advertised through social media platforms stimulates the buying behavior of the consumer. Additionally, social media engagement has a positive effect on consumer buying, suggesting that increase in social media engagement stimulates the buying behavior of the consumer. Moreover, brand trust has a positive effect on consumer buying behavior. It implies that increase in brand trust drive the consumer to purchase the particular products. Likewise, advertisement frequency has a positive effect on consumer buying behavior. It shows that increase in the frequency of advertisement in social media leads to increase in consumer buying behavior. Influencer endorsement has a positive effect on consumer buying behavior. It means that increase in the endorsement by the social media influencer enhance consumer buying behavior.

Keywords: social media marketing, consumer buying behavior, fashion industry, content quality, product quality, brand trust, influencer endorsement

1. Introduction

Social media has transformed marketing by changing how businesses communicate with consumers. With billions of people spending time on platforms like Facebook, Instagram, and Twitter, companies are increasingly using social media to advertise and engage with potential customers. Social media is a powerful tool for promoting products and building brand relationships with consumers. It enables businesses to enhance brand awareness and engage customers through posts and content, which influences consumer purchasing decisions (Mahoney and Tang, 2018). Consumer buying behavior refers to the decision-making processes and actions individuals take when purchasing products or services, encompassing the factors that influence their choices and preferences (Solomon et al., 2020). Social media influences consumer buying behavior by enhancing brand awareness, facilitating product discovery, and providing platforms for reviews and recommendations. The interactivity and immediacy

* Ms. Shikhrakar is a Freelance Researcher, Kathmandu, Nepal and Mr. Rawat is the Research Faculty, Uniglobe College (Pokhara University affiliate), Kathmandu, Nepal.

of social media enable consumers to seek real-time feedback, compare products, and make informed decisions (Kumar and Shah, 2021). Furthermore, the persuasive power of social media advertising, particularly through targeted ads and influencer endorsements, has been shown to affect consumer perceptions and drive purchase intentions (Liu et al., 2021). Understanding consumer buying behavior in the digital age involves analyzing how social media interactions, brand engagement, and content consumption impact consumer choices and brand loyalty (Hutter et al., 2013)

Consumers rely on peer reviews, ratings, and user-generated content for social proof before making purchase decisions. This trend is particularly strong in fashion, where online reviews and real-time feedback help validate consumer choices (Cheung et al., 2008). The internet enables consumers to research products, compare prices, and make quicker, safer purchases. Social media also serves as a tool for marketing, allowing businesses to reach potential customers efficiently. Social media marketing helps businesses grow by fostering two-way communication with customers at a low cost, helping companies build relationships and increase market share. Social media and content marketing are essential for digital advertising. Businesses create and publish online content to engage consumers, provide information, and influence purchasing behavior, especially as consumers increasingly research before buying (Schwarzl and Grabowska, 2015). Customer satisfaction and loyalty are strongly influenced by online interactions. Positive word of mouth and social media interactions are key to building brand loyalty, which drives repeat purchases and recommendations. Social media has evolved from a way to stay connected with friends to an interactive platform for businesses to market products. It enables communication between businesses, consumers, and influencers, significantly impacting consumer behavior (Hossain and Sakib, 2016).

In the fashion industry, social media platforms like Instagram and TikTok influence consumer behavior by allowing direct interaction with brands, shaping how consumers discover and evaluate products, and driving impulse purchases, especially among younger generations (Kohli et al., 2021). Influencers play a significant role in shaping consumer fashion choices. Consumers are more likely to buy products endorsed by influencers they trust, with influencer marketing driving trends in the fashion industry (Kim and Kim, 2020). Understanding the nuances of advertisement frequency is crucial for brands aiming to optimize their social media marketing strategies and achieve lasting success. Advertisement frequency, the number of times a consumer is exposed to an ad, significantly influences consumer behavior, shaping their perceptions, recall, and engagement with the brand. Striking the right balance is essential; excessive frequency may lead to ad fatigue and negative impressions, while too few exposures risk failing to build awareness or drive action. By analyzing consumer preferences, platform algorithms, and performance metrics, brands can fine-tune their advertising efforts to maintain relevance, foster trust, and enhance overall campaign effectiveness.

Content marketing, through various formats like videos and blogs, helps businesses provide valuable information to consumers. This has become increasingly important as consumers have more choices and prefer researching products before purchasing (Habibi et al., 2014). In an era where consumers have abundant choices and prefer to research products thoroughly before purchasing, content marketing helps build trust, educate audiences, and guide decision-making. This comprehensive understanding of social media engagement highlights its significant role in shaping consumer buying behavior and fostering stronger brand-consumer relationships. This emphasis on building and maintaining trust is critical for brands aiming to enhance consumer loyalty and drive sales in a competitive market environment. This strategic approach can maximize the impact of influencer endorsements on consumer buying behavior, fostering stronger brand connections and encouraging purchase decisions.

Social media platforms offer companies a means to establish and strengthen trust by directly connecting with consumers, resolving their problems, and exhibiting transparency (Kim and Kim, 2020). As customers increasingly depend on online reviews and social media material for purchase decisions, the perceived credibility and dependability of a brand significantly influence their behavior (Delgado-Ballester and Munuera-Alemán, 2020). Yang et al. (2021) discovered that trust in social media material favorably influences customer sentiments towards the company and enhances the probability of purchase. Furthermore, the reliable provision of superior content and attentive customer care on social media platforms enhances brand trust and promotes repeat patronage (Eisenbeiss et al., 2014). The use of influencers' trustworthiness and audience size to boost brand impressions and purchase intents has made influencer endorsement a potent strategy for influencing consumer purchasing behavior. The endorsements of influential people, who are seen as authorities or trustworthy individuals in their respective fields, can have a substantial influence on consumer choices (Freberg et al., 2011). Influencer endorsements work best when people believe the influencer is genuine and has something to offer the company (Lou and Yuan, 2019). For instance, according to Kim and Kim (2020), influencers who really believe in and promote a brand's goods and principles are able to persuade consumers more than ads that are more generically marketed. In addition, influencers may have one-on-one conversations with their followers on social media, which can lead to more engaging content and ultimately greater sales (Marques et al., 2021).

In Nepalese context, visual platforms like Instagram are crucial for fashion marketing in Nepal, where influencers and peer reviews drive purchasing decisions. Social media enables local brands to compete globally by reaching a wider audience (Acharya et al., 2020). In Nepal, social proof, such as peer reviews and influencer endorsements, significantly impacts consumer trust and purchasing behavior. The interactive nature of social media accelerates this influence (Tamang and Lama, 2019). Social media has led to an increase in impulse buying, especially among younger Nepali consumers, who are influenced by limited-time offers, trends, and influencer promotions on platforms like Instagram (Poudel and Thapa, 2018). Social media marketing is a key factor in shaping consumer behavior in Nepal's fashion industry. As social media penetration grows, its influence on consumer engagement and purchasing decisions will continue to deepen, transforming the local fashion market (Shrestha and Gurung, 2021).

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of social media marketing on consumer buying behavior in fashion industry. 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 media marketing on consumer buying behavior in Nepalese fashion industry. Specifically, it examines the relationship of content quality, product quality, social media engagement, brand trust, advertisement frequency and influencer endorsement with consumer buying behavior in Nepalese fashion industry.

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 232 respondents through questionnaire. The study is based on convenience sampling method. The respondents' views were collected on content quality, product quality, social media engagement, brand trust, advertisement

frequency and influencer endorsement and buying behavior in Nepalese fashion industry. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that consumer buying behavior depend upon various social media marketing factors. The dependent variable selected for the study is consumer buying behavior. Similarly, the selected independent variables are content quality, product quality, social media engagement, brand trust, advertisement frequency and influencer endorsement. Therefore, the model takes the following form.

$$CBB = \beta_0 + \beta_1 CQ + \beta_2 PQ + \beta_3 SME + \beta_4 BT + \beta_5 AF + \beta_6 IF + e$$

Where,

CBB= Consumer buying behavior

CQ= Content quality

PQ= Product quality

SME= Social media engagement

BT= Brand trust

AF= Advertisement frequency

IE= Influencer endorsement

Consumer buying behavior was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 6 items and sample items include “The quality of photos and videos shared by fashion brands on social media influences my decision to purchase their products”, “I feel more familiar and comfortable purchasing from brands that frequently advertise on social media” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.868$).

Content quality 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 content shared by fashion brands on social media is visually appealing”, “The quality of fashion-related content on social media influences my interest in the brand” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.864$).

Product quality 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 materials used in the products promoted by fashion brands on social media are of high quality”, “The fashion products promoted on social media are consistent with their descriptions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.827$).

Social media engagement 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 follow fashion brands on social media to stay updated on new

products and promotions”, “I prefer brands that respond promptly to my queries or comments on social media” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.866$).

Brand trust 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 believe that fashion brands with a strong social media presence are reliable”, “I am more likely to purchase from a fashion brand I follow and trust on social media” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.843$).

Advertisement frequency 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 see advertisements from Nepalese fashion brands on my social media feed”, “The number of advertisements from fashion brands on social media feels excessive”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.796$).

Influencer endorsement 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 trust fashion products endorsed by social media influencers in Nepal”, “Influencers’ recommendations on social media affect my decision to purchase fashion products” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.874$).

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

Content quality (CQ)

High-quality content serves as the foundation for building strong consumer-brand relationships, as it not only attracts but also retains the interest of potential customers (Ansari, 2019). This connection is essential for influencing consumer buying behavior, particularly in the digital age where consumers are inundated with content from various sources. Similarly, Tuten and Solomon (2017) argued that the strategic creation of high-quality content tailored to the preferences of the target audience is essential for leveraging social media marketing to influence consumer buying behavior effectively. According to Alkharabsheh and Zhen (2021), the critical role of content quality in shaping consumer perceptions, driving engagement, and ultimately, influencing buying behavior in the competitive landscape of social media marketing. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between content quality and consumer buying behavior.

Product quality (PQ)

Product quality is a critical determinant of consumer buying behavior, especially in the context of social media marketing, where consumers rely heavily on visual and descriptive cues. According to Pham and Ahammad (2017), high product quality communicated through social media can significantly enhance consumer perceptions and trust, thereby influencing their purchase decisions. Additionally, Escobar-Rodriguez and Bonson-Fernandez (2017) noted that the visual representation of product quality on social media, such as through unboxing videos or product demonstrations, can significantly influence consumer perceptions and foster brand loyalty. Al-Dwairi et al. (2024) further highlighted that the consistency in communicating product quality across social media platforms is crucial for maintaining consumer trust and encouraging repeat purchases. This emphasis on product

quality as perceived through social media marketing is particularly relevant in the fashion industry, where consumer expectations are closely tied to the perceived excellence of the products they choose to buy. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between product quality and consumer buying behavior.

Social media engagement (SME)

Social media engagement is a crucial factor influencing consumer buying behavior, as it encompasses the interactions and connections between consumers and brands on social media platforms. According to Kumar and Shah (2021), high levels of engagement, such as likes, comments, and shares, can significantly enhance consumer perceptions of brand value and influence purchase intentions. Engagement not only helps in building a brand's presence but also fosters a sense of community and loyalty among consumers (Brookes et al., 2021). According to Ladhari and Michaud (2015), the interactive nature of social media allows brands to address customer inquiries and feedback promptly, thereby enhancing customer satisfaction and loyalty. Additionally, the strategic use of engagement metrics, such as engagement rates and sentiment analysis, enables brands to tailor their marketing strategies more effectively to meet consumer preferences and expectations. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship social media engagement and consumer buying behavior

Brand trust (BT)

Brand trust is a fundamental element influencing consumer buying behavior, particularly in the context of social media marketing. Trust established through social media interactions significantly impacts consumer loyalty and purchase intentions (Sweeney et al., 2020). Social media platforms provide a venue for brands to build and reinforce trust by engaging directly with consumers, addressing their concerns, and demonstrating transparency (Kim and Kim, 2020). As consumers increasingly rely on online reviews and social media content to make purchasing decisions, the perceived credibility and reliability of a brand play a crucial role in shaping their behavior (Delgado-Ballester and Munuera-Alemán, 2020). Yang et al. (2021) found that trust in social media content positively affects consumer attitudes towards the brand and increases the likelihood of purchase. Moreover, the consistent delivery of high-quality content and responsive customer service on social media platforms helps strengthen brand trust and encourages repeat business (Eisenbeiss et al., 2014). Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship brand trust and consumer buying behavior.

Advertisement frequency (AF)

Advertisement frequency plays a significant role in shaping consumer buying behavior, especially within the realm of social media marketing. Frequent exposure to advertisements can enhance brand recall and influence consumer purchase decisions by keeping the brand top-of-mind (Grewal et al., 2017). However, excessive ad frequency can lead to ad fatigue, where consumers become annoyed or disengaged, potentially diminishing the effectiveness of the marketing efforts (Crisp and Turner, 2020). Furthermore, Leong et al. (2020) highlighted that the timing and contextual relevance of ads are essential factors in determining their effectiveness; well-timed ads that align with consumer interests and needs are more likely to drive positive responses. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship advertisement frequency and consumer buying behavior.

Influencer endorsement (IE)

Influencer Endorsement has become a powerful tool in shaping consumer buying behavior, leveraging the credibility and reach of influencers to enhance brand perceptions and drive purchase intentions. Influencers, who are perceived as experts or trusted figures in their niches, can significantly impact consumer decisions through their endorsements (Freberg *et al.*, 2011). Recent research indicates that the effectiveness of influencer endorsements is largely dependent on the perceived authenticity and relevance of the influencer to the brand (Lou and Yuan, 2019). For example, influencers who authentically align with a brand's values and products can foster greater trust and influence consumer attitudes more effectively than traditional advertising (Kim and Kim, 2020). Furthermore, the interactive nature of social media platforms allows influencers to engage directly with their followers, creating personalized and interactive experiences that can enhance consumer loyalty and drive sales (Marques *et al.*, 2021). Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship influencer endorsement and consumer buying behavior.

3. Results and discussion

Correlation analysis

Having indicated the descriptive statistics, Pearson's 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 and independent variables. The correlation coefficients are based on 232 observations. The dependent variable is CBB (Consumer buying behavior). The independent variables are CQ (Content quality), PQ (Product quality), SME (Social media engagement), BT (Brand trust), AF (Advertisement frequency) and IE (Influencer endorsement).

Variables	Mean	SD	CBB	CQ	PQ	SME	BT	AF	IE
CBB	3.144	0.927	1						
CQ	3.657	0.814	0.591**	1					
PQ	3.248	0.878	0.539**	0.520**	1				
SME	2.949	0.976	0.389**	0.432**	0.546**	1			
BT	3.452	0.937	0.523**	0.494**	0.520**	0.522**	1		
AF	2.814	0.849	0.362**	0.524**	0.511**	0.408**	0.494**	1	
IE	3.483	0.964	0.576**	0.547**	0.574**	0.587**	0.538**	0.542**	1

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

Table 1 reveals that content quality is positively correlated to consumer buying behavior, indicating that better quality of fashion contents in social media platforms lead to enhanced consumer buying behavior. Similarly, product quality is positively correlated to consumer buying behavior. It implies that better quality of fashionable products advertised through social media platforms stimulates the buying behavior of the consumer. Additionally, social media engagement is positively correlated

to consumer buying, suggesting that increase in social media engagement stimulates the buying behavior of the consumer. Moreover, brand trust is positively correlated to consumer buying behavior. It implies that increase in brand trust drive the consumer to purchase the particular products. Likewise, advertisement frequency is positively correlated to consumer buying behavior. It shows that increase in the frequency of advertisement in social media leads to increase in consumer buying behavior. Influencer endorsement is positively correlated to consumer buying behavior. It means that increase in the endorsement by the social media influencer enhance consumer buying behavior.

Regression analysis

Having indicated the Kendall's tau correlation coefficients, the regression has been carried out and result are presented in Table 2. More specifically, Table 2 shows the regression results of content quality, product quality, social media engagement, brand trust, advertisement frequency and influencer endorsement on consumer buying behavior in Nepalese fashion industry.

Table 2

Estimated regression results of content quality, product quality, social media engagement, brand trust, advertisement frequency and influencer endorsement on consumer buying behavior in Nepalese fashion industry

The results are based on 232 observations using linear regression model. The model is $CBB = \beta_0 + \beta_1 CQ + \beta_2 PQ + \beta_3 SME + \beta_4 BT + \beta_5 AF + \beta_6 IF + e$, where the dependent variable is CBB (Consumer buying behavior). The independent variables are CQ (Content quality), PQ (Product quality), SME (Social media engagement), BT (Brand trust), AF (Advertisement frequency) and IE (Influencer endorsement).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CQ	PQ	SME	BT	AF	IE			
1	0.761 (4.770)**	0.683 (18.314)**						0.501	0.727	158.574
2	0.609 (9.784)**		0.583 (10.434)**					0.493	0.717	118.697
3	0.372 (2.727)**			0.472 (3.727)**				0.395	0.534	97.241
4	1.3414 (3.307)**				0.472 (3.727)**			0.347	0.558	82.180
5	0.229 (2.624)**					0.397 (2.922)**		0.376	0.449	63.044
6	0.284 (2.433)*						0.619 (15.463)**	0.541	0.724	174.782
7	0.743 (3.011)**	0.468 (15.140)**	0.602 (5.023)**					0.564	0.628	103.209
8	0.119 (1.553)	0.227 (8.578)**	0.465 (4.426)**	0.124 (3.584)*				0.632	0.578	59.517
9	0.155 (1.730)	0.189 (4.139)**	0.254 (2.148)*	0.114 (2.763)**	0.526 (9.399)**			0.642	0.471	76.924
10	0.079 (1.387)	0.165 (3.449)**	0.121 (1.690)	0.105 (1.364)	0.259 (4.919)**	0.352 (1.787)		0.532	0.548	68.584
11	0.207 (1.094)	0.047 (2.594)**	0.601 (1.465)	0.087 (0.608)	0.197 (2.288)*	0.232 (0.915)	0.527 (2.12)**	0.648	0.492	88.494

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.
- Consumer buying behavior is the dependent variable.

Table 2 shows the beta coefficients for content quality are positive with consumer buying behavior. It indicates that content quality has a positive impact on consumer buying behavior. This finding is consistent with the findings of Tuten and Solomon (2017). Likewise, the beta coefficients

for product quality are positive with consumer buying behavior. It indicates that product quality has a positive impact on consumer buying behavior. This finding is similar to the findings of Pham and Ahammad (2017). Similarly, the beta coefficients for social media engagement are positive with consumer buying behavior. It indicates that social media engagement has a positive impact on consumer buying behavior. This finding is consistent with the findings of Kumar and Shah (2021). The beta coefficients for brand trust are positive with consumer buying behavior. It indicates that brand trust has a positive impact on consumer buying behavior. This finding is consistent with the findings of Yang *et al.* (2021). Similarly, the beta coefficients for advertisement frequency are positive with consumer buying behavior. It indicates that advertisement frequency has a positive impact on consumer buying behavior. This finding is similar to the findings of Grewal *et al.* (2017). Likewise, the beta coefficients for influencer endorsement are positive with consumer buying behavior. It indicates that influencer endorsement has a positive impact on consumer buying behavior. This finding is consistent with the findings of Marques *et al.* (2021).

4. Summary and conclusion

There has been a drastic changes in marketing due to the rise of social media and the way brands interact with their customers. Businesses are capitalizing on the massive user bases of social media sites like Facebook, Instagram, and Twitter by advertising and interacting with prospective clients there. Using social media to promote products and create customer interactions with brands is a significant move. Posts and content allow businesses to engage customers and increase brand exposure, which in turn impacts consumer purchase decisions.

This study attempts to analyze the impact of social media marketing on consumer buying behavior in Nepalese fashion industry. The study is based on primary data with 232 observations.

The major conclusion of the study is that content quality, product quality, social media engagement, brand trust, advertisement frequency and influencer endorsement have positive effect on consumer buying behavior in Nepalese fashion industry. Consumers are more likely to purchase fashion products when social media content is high-quality, product offerings are perceived as durable and consistent, and brands foster trust through regular, transparent interactions. The study also concluded that content quality as the most influential factor followed by product quality and influencer endorsement that explains the change in consumer buying behavior in Nepalese fashion industry.

References

- Acharya, S., R. Shrestha, and D. Karki, 2020. The influence of social media influencers on fashion buying behavior in Nepal. *Nepalese Journal of Marketing* 18(3), 112-125.
- Al-Dwairi, R., I. Shehabat, A. Zahrawi, and Q. Hammouri, 2024. Building customer trust, loyalty, and satisfaction: The power of social media in e-commerce environments. *International Journal of Data and Network Science* 8(3), 1883-1894.
- Alkharabsheh, O. H. M., and B. H. Zhen, 2021. The impact of content marketing, social media marketing and online convenience on consumer buying decision process. *Journal of Management, Business, Innovation, Education and Social Sciences* 1(1), 1823-1834.
- Ansari, S., G. Ansari, M. U. Ghori, and A. G. Kazi, 2019. Impact of brand awareness and social media content marketing on consumer purchase decision. *Journal of Public Value and Administrative Insight* 2(2), 5-10.
- Brookes, B., C. Carr, and J. Waddington, 2021. Social media engagement and brand loyalty: A study of the impact

- of social media engagement on consumer loyalty. *Journal of Marketing Communications* 27(3), 278-293.
- Cheung, C. M. K., M. K. O. Lee, and N. Rabjohn, 2008. The impact of electronic word-of-mouth: The adoption of online opinions in online customer communities. *Internet Research* 18(3), 229-247.
- Crisp, R. J., and R. N. Turner, 2020. Social influence and the impact of advertisement frequency on consumer attitudes. *Journal of Consumer Research* 46(4), 713-728.
- Delgado-Ballester, E., and J. L. Munuera-Alemán, 2020. Brand trust in the context of social media: An analysis of online brand communities. *Journal of Business Research* 112(1), 522-530.
- Eisenbeiss, M., M. Schreeb, and N. Maehle, 2014. The impact of social media on brand trust and brand loyalty: Evidence from the financial services sector. *Journal of Interactive Marketing* 28(4), 209-225.
- Escobar-Rodriguez, T., and R. Bonson-Fernandez, 2017. Social media in travel, tourism and hospitality: A literature review. *Journal of Social Media in Society* 6(2), 104-139.
- Freberg, K., K. Graham, K. McGaughey, and L. A. Freberg, 2011. Who are the social media influencers? A study of personality traits of social media influencers. *Public Relations Review* 37(1), 90-92.
- Grewal, D., A. L. Roggeveen, and J. Nordfält, 2017. The future of retailing. *Journal of Retailing* 93(1), 1-6.
- Habibi, M. R., M. Laroche, and M. O. Richard, 2014. The roles of brand community and community engagement in building brand trust on social media. *Computers in Human Behavior* 37(1), 152-161.
- Hossain, S., and M. N. Sakib, 2016. The impact of social media marketing on university students' brand loyalty. *International Journal of Marketing and Business Communication* 5(3), 1-7.
- Hutter, K., J. Hautz, S. Dennhardt, and J. Füller, 2013. The impact of user interactions in social media on brand awareness and purchase intention. *Journal of Retailing and Consumer Services* 20(5), 457-465.
- Kim, J., and M. Kim, 2020. The effects of social media marketing activities on brand trust and brand loyalty: The role of social media marketing in the consumer-brand relationship. *Journal of Business Research* 119(1), 176-185.
- Kohli, S., G. Suri, and A. Kapoor, 2021. Social media marketing: A study of the influence of social media on consumer buying behavior in the fashion industry. *Journal of Marketing Communications* 23(2), 179-190.
- Kumar, V., and D. Shah, 2021. The impact of social media marketing on consumer buying behavior: Insights from a longitudinal study. *Journal of Marketing Research*, 58(4), 691-707.
- Ladhari, R., and M. Michaud, 2015. eWOM effects on hotel booking intentions, attitudes, trust, and website perceptions. *International Journal of Hospitality Management* 46(1), 36-45.
- Leong, H. K., W. H. Lee, and S. K. Lee, 2020. Timing and effectiveness of social media advertisements: An empirical study. *Journal of Interactive Marketing* 52(2), 30-45.
- Liu, Y., J. C. Sweeney, and J. Wang, 2021. The effects of social media marketing on consumer purchasing behavior: A meta-analysis. *Journal of Business Research* 135(1), 282-291.
- Lou, C., and S. Yuan, 2019. Influencer marketing: A new era of social media marketing. *Journal of Advertising* 48(3), 293-310.
- Mahoney, L. M., and T. Tang, 2024. *Strategic Social Media: From Marketing to Social Change* (John Wiley and Sons, New York).

- Marques, A. C., J. J. Ferreira, and J. A. Silva, 2021. The impact of influencer marketing on consumer behavior: An empirical study. *Journal of Marketing Research* 58(4), 657-675.
- Pham, T. T. T., and M. F. Ahammad, 2017. Social media use and consumer behavior: The case of Vietnamese cosmetics. *Journal of Retailing and Consumer Services* 35(1), 127-134.
- Poudel, S., and R. Thapa, 2018. Social media and impulse buying behavior: A study of young consumers in Nepal. *Journal of Consumer Research Nepal* 5(2), 39-52.
- Schwarzl, S., and M. Grabowska, 2015. Online marketing strategies: the future is here. *Journal of International Studies* 8(2), 187-196.
- Shrestha, M., and S. Gurung, 2021. The role of influencer marketing in shaping consumer buying behavior in Nepal's fashion sector. *South Asian Journal of Marketing* 10(1), 67-79.
- Solomon, M. R., G. W. Marshall, and E. W. Stuart, 2020. *Marketing: Real People, Real Choices* (Pearson, London).
- Sweeney, J. C., G. N. Soutar, and L. W. Johnson, 2020. The role of brand trust in the development of customer loyalty: A review and meta-analysis. *Journal of Marketing Theory and Practice* 28(1), 68-82.
- Tamang, R., and S. Lama, 2019. Social proof and consumer buying behavior in the fashion sector in Nepal. *Journal of Business Studies* 12(4), 134-145.
- Tuten, T. L., and M. R. Solomon, 2017. *Social Media Marketing* (Sage Publications, Thousand Oaks, CA).
- Yang, W., X. Li, and W. Xu, 2021. Trust and purchase intention in social media marketing: A meta-analysis of social media marketing literature. *Journal of Retailing and Consumer Services*, 60(1), 1024-1041.

Chapter 23

Impact of Customer Relationship Management on Customer Satisfaction and Retention: A Case of Nepalese Enterprises

Pankaj Chand*

Abstract

This study examines the impact of customer relationship management on customer satisfaction and retention in the context of Nepalese enterprises. Customer satisfaction and customer retention are selected as the dependent variables. The selected independent variables are service quality, employees' behavior, complaint handling, interaction management and customer focus. The primary source of data is used to assess the opinions of respondents regarding service quality, employees' behavior, complaint handling, interaction management, customer focus, customer satisfaction, and customer retention. The study is based on primary data of 187 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 relationship management on customer satisfaction and retention in the context of Nepalese enterprises.

The study showed that service quality has a positive impact on customer satisfaction and customer retention. It indicates that rising service quality precedes rising customer satisfaction and customer retention. Similarly, employees' behavior has a positive impact on customer satisfaction and customer retention. It indicates that good behavior of staffs leads to increase in consumer satisfaction and customer retention. Likewise, complaint handling has a positive impact on customer satisfaction and customer retention. It indicates that responding to consumer complaints more quickly increases customer satisfaction and customer retention. Further, interaction management has a positive impact on customer satisfaction and customer retention. It indicates that better management of customer engagement leads to increase in customer satisfaction and customer retention. In addition, customer focus has a positive impact on customer satisfaction and customer retention. It indicates that meeting customer demands lead to higher levels of customer satisfaction and customer retention.

Keywords: service quality, employees' behavior, complaint handling, interaction management, customer focus, customer satisfaction, customer retention

1. Introduction

Customer relationship management is a crucial aspect for every firm as it enables a customer-focused business strategy to maintain successful marketing, sales, and service procedures. Customer relationship management may facilitate the identification of potential prospects and partners, while also integrating the requirements of prospective customers with data about current customers. By utilizing this information, a corporation may differentiate its products and services in order to provide unparalleled offerings to new segments of customers (Tiwana, 2001). Several organizational advantages arise from utilizing customer relationship management, enabling organizations to establish a more intimate connection with clients while simultaneously enhancing customer happiness and retention. Customer relationship management solutions facilitate the presentation of messages that contribute to the streamlining of a durable relationship framework between the organization and its clients (Hendricks *et al.*, 2007). Pursuing new business demands a significant amount of time, energy, and resources for several companies globally. The primary goals include retaining existing customers and enhancing customer relationships, while also prioritizing corporate growth and expansion into

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

new areas. In recent years, businesses of many sizes and types have recognized the advantages of prioritizing customer happiness. This is because it is more cost-effective to keep existing consumers than to acquire new ones. The correlation between customer happiness and profitability has been validated, so enhancing customer satisfaction becomes a crucial objective for firms (Ahrari and Amirusefi, 2012). Customer relationship management is the term used to describe a dynamic and integrated structure. The connection between industry practices and technology architecture is crucial for improving customer loyalty and satisfaction. This is achieved by cultivating strong relationships of trust and commitment between customers and staff, ultimately facilitating the growth of the firm. Customer relationship management procedures are essential for banks to keep their established clients in a highly competitive market (Thaichon *et al.*, 2019).

Customer relationship management refers to the practice of overseeing a company's engagements with suppliers, customers, and potential business partners. Efficiently organizing, streamlining, and synchronizing the use of technology for corporate operations is essential. The goal of customer relationship management is to enhance productivity, increase revenue, and foster customer loyalty (Lambert and Enz, 2017). Service providers have implemented various technologies, tactics, and processes to enhance customer interactions and increase revenues in order to enforce customer relationship management. According to Babu (2016), customer relationship management is not just a technological issue, but rather a significant concern related to the market and operations. In today's retail landscape, clients have higher expectations for enterprises to offer a wider range of items and services, necessitating the need for additional facilities. Companies should take into account consumers' wants, interests, and purchasing behavior. Customers should then create and oversee experiences in order to construct the most favorable experience for customers (Nazar *et al.*, 2018). The company's primary objective is to enhance client loyalty by leveraging technology and customer relationship management's principles. Companies are progressively enhancing their internal customer retention methods to cultivate a customer-focused and hospitable team (Al-Weshah *et al.*, 2018). According to Nazar *et al.* (2020), the corporation is committed to fulfilling consumer demands and striving to accomplish it with more efficiency than competitors. Implementing a specialized methodology for data retrieval will enable efficient data use and facilitate the establishment of a centralized system for managing customer experience, including top-tier customer assistance. Enhancements are necessary for the support of customer relationship management throughout the areas of communication, delivery, and operations.

Consumers are progressively acquiring greater expertise and understanding of various restaurant protocols, while the demand for food is on the rise. Fast-food industry is experiencing a significant lack of direction, prompting suppliers to implement successful advertising tactics in order gain competitive advantages and enhance their comprehension of consumer demands (Filimonau and Krivcova, 2017). To enhance the financial efficiency of the firm, certain fast-food restaurants are actively participating in the research, analysis, and implementation of marketing campaigns with the goal of acquiring the largest portion of the consumer market and ensuring customer loyalty and retention. In the context of restaurant management, customer service plays a critical role and is widely recognized as a key factor in attracting repeat customers, fostering consumer engagement, and generating positive word-of-mouth publicity (Rao *et al.*, 2020). There is a direct correlation between customer satisfaction and customer retention, meaning that as customer satisfaction increases, so does client retention. The satisfaction of clients has a significant and motivating effect on their continued loyalty. In order for insurance organizations to maintain a competitive edge, it is imperative for customers to remain inside the insurance sector. In the insurance industry, prioritizing client retention takes precedence above customer acquisition for organizations. Customer retention is evaluated by considering many characteristics of customer relationship management, such as the effectiveness of

insurance organizations, positive word-of-mouth recommendations, customer loyalty to insurance firms, and the desire to make repeated purchases (Xing and Devasia, 2019).

Customer satisfaction is a crucial metric for every organization as it aids in the development, assessment, and evaluation of product and service offerings, while also serving as a source of inspiration and motivation for staff. Client satisfaction and client focus are crucial competitive benefits in all aspects of manufacturing (Kotler, 2000). Therefore, it would be advantageous for organizations to comprehend how the use of CRM may enhance customer satisfaction rates. Customer relationship management significantly influences several company sectors, including the hotel industry, by enhancing customer satisfaction and resolving a multitude of other business challenges. Customer relationship management and hospitality are interconnected since they offer a structured platform for employees to cultivate diverse abilities, enabling them to serve clients attentively and with a pleasant demeanor. Thus, to provide excellent hospitality and favorable client interactions, staff members of commercial organizations must maintain a set of desirable attributes (Agnihotri *et al.*, 2016). Employees in the hotel sector who are responsible for food and beverage service must possess an unwavering commitment to their clients. This entails ensuring that their actions on the premises are primarily dedicated to delivering exceptional hospitality in restaurants and catering services (Meng and Elliott, 2008). Exceptional aptitude for active listening and effective communication, along with unwavering concentration to ensure comprehensive understanding of client requirements, are supplementary qualities. Business enterprises must prioritize many aspects to satisfy their clients, including quality, environmental sustainability, employee satisfaction, and additional services. The ideology of employee satisfaction is focused on meeting the requirements of the employees. Businesses have also realized that when they lose a consumer, they not only lose one transaction, but also the potential for future purchases and recommendations. The primary objective of marketing is to acquire new consumers by offering exceptional value and to maintain existing customers by providing satisfactory experiences (Prasilowati *et al.*, 2021).

According to Zeithamal *et al.* (2016), the objective of external marketing is to initiate commitment, whereas interactive marketing is to fulfill commitment, and internal marketing focuses on creating the capability to fulfill commitment. In other words, the three marketing areas defined in the service triangle are essential for achieving effective service and increasing corporate profitability. Internal marketing is a communication strategy aimed at fostering a customer-oriented business culture (Ngai, 2015). The reason for this is because the majority of research on IM is based on norms and there are currently very few empirical studies available. Although the majority of empirical research have mostly focused on investigating the correlation between internal marketing and workers' happiness and dedication, there has been less attention given to analyzing the impact of internal marketing strategies on improving external marketing outcomes. There is a lack of concrete scientific data supporting a positive correlation between information management approaches and organizational effectiveness (Ahmed *et al.*, 2020).

In the context of Nepal, Mahato and Goet (2020) examined the service quality, customer satisfaction and customer loyalty in Nepalese restaurant industry. The study found that service quality, price, customer loyalty, Service quality, time and behavior positive relation with the customer satisfaction, as it has become the basis for how customers interpret hospitality service and, in the end, how it interacts and operates with restaurant services. Similarly, Sah (2023) analyzed the consumers' attitude towards online shopping in Kathmandu Valley. The findings revealed that online shopping is less effective than traditional shopping. The majority of consumers have positive attitudes towards online shopping. Likewise, Shrestha (2023) analyzed online shopping attitude and purchase intention of Nepalese consumers: Moderated mediation of social media. The study found that consumer perception, product variety, trust, attitude and social media that play a crucial role in influencing online shopping

intentions.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of customer relationship management on customer satisfaction and retention. 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 customer relationship management on customer satisfaction and retention in the context of Nepalese enterprises. Specifically, it examines the relationship of service quality, employees' behavior, complaint handling, interaction management and customer focus with customer satisfaction and retention in the context of Nepalese enterprises.

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 187 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on service quality, employees' behavior, complaint handling, interaction management, customer focus, customer satisfaction, and customer retention. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that customer satisfaction and customer retention depend upon customer relationship management. Customer satisfaction and customer retention are selected as the dependent variables. Similarly, the selected independent variables are service quality, employees' behavior, complaint handling, interaction management and customer focus. Therefore, the model takes the following form:

$$CS = \beta_0 + \beta_1 SQ + \beta_2 EB + \beta_3 CH + \beta_4 IM + \beta_5 CF + e$$

$$CR = \beta_0 + \beta_1 SQ + \beta_2 EB + \beta_3 CH + \beta_4 IM + \beta_5 CF + e$$

Where,

CS = Customer satisfaction

CR = Customer retention

SQ = Service quality

EB = Employees behavior

CH = Complaint handling

IM = Interaction management

CS = Customer focus

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 "The Company's customer relationship management efforts positively

influence my satisfaction with their products/services”, “I feel satisfied with the company’s Customer relationship management practices and how they manage customer relationships” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Customer 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 were 5 items and sample items include “I am likely to recommend this company to others based on their customer relationship management practices”, “Positive experiences with the company’s customer relationship management efforts increase my likelihood of making repeat purchases” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Service quality 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 “High service quality makes me more likely to purchase additional products or service from the company”, “The service quality provided by the company makes me feel valued as a customer” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.850$).

Employee behavior 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 “The behavior of employees positively influences my satisfaction with the company”, “I feel valued as a customer due to the way employees treat me” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Complaint handling 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 “Complaint handled positively influences my satisfaction with the company”, “I feel valued as a customer because of the effective handling of my complaint” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.820$).

Interaction 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 “I am more likely to purchase from the company again due to the effective management of my interactions”, “The Company’s interaction management influences my decision to return to the store/business” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.840$).

Customer focus 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 experience with the company’s customer focus enhances my overall satisfaction”, “The Company’s customer-centric approach makes me feel more confident in their products/services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.830$).

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

Service quality

Undoubtedly, there exists a firmly proven correlation between service quality and customer satisfaction. Service quality is the comprehensive evaluation of a service, taking into account several elements like reliability, responsiveness, assurance, empathy, and tangibles (such as the physical

environment or look of facilities). Afthanorhan *et al.* (2019) examined the effects of service quality on customer satisfaction. The study found that there is a positive relationship between customer satisfaction and retention. Similarly, Ali *et al.* (2021) investigated the impact of service quality on customer satisfaction in hospitality. The study showed that service quality has a positive impact on customer satisfaction. Likewise, Abdirad and Krishnan (2022) revealed that service quality has a positive and significant impact on customer satisfaction and retention. Based on it, the study develops following hypothesis:

H₁: There is a positive relationship of service quality on customer satisfaction and customer retention.

Employees' behavior

The manner in which workers engage with consumers is of utmost importance in molding the overall customer experience and may greatly impact customer satisfaction with a company's offerings. Agatep and Villalobos (2021) examined the impact of employee behavior to customer satisfaction among selected establishments in Zambales, Philippines. The study showed that employees' behavior has a positive impact on customer satisfaction. Similarly, Abdelhamied (2019) investigated the impact of training activities on quality of service, customer satisfaction and behavioral intention. The study stated that there is a positive relationship of employees' behavior with customer satisfaction and retention. Likewise, Disse and Becker-Ozcamlica (2022) revealed that there is a positive relationship of employees' behavior on customer satisfaction and customer retention. Based on it, the study develops following hypothesis:

H₂: There is a positive relationship of employees' behavior on customer satisfaction and customer retention.

Complaints handling

Efficient management of complaints is a vital component of customer service that directly impacts customer satisfaction, especially in the event of mishaps. Susanti (2021) examined the complaints handling satisfaction mediates between complaints handling to customer loyalty for the Indonesian banking industry. The study stated that complaints handling has a positive relationship with customer satisfaction. Similarly, Nkrumah *et al.* (2019) assessed the complaint handling processes among Ghanaian rural banks and its influence on customer satisfaction. The study revealed that complaints handling has a positive influence on customer satisfaction. Likewise, Kuria and Muturi (2018) revealed that there is a positive relationship between complaints handling and customer retention. Based on it, the study develops following hypothesis:

H₃: There is a positive relationship of complaints handling on customer satisfaction and customer retention.

Interaction management

Iyadi and Chiyem (2022) examined the customer relationship management and its effect on business growth: a focus on microfinance banks in Delta State, Nigeria. The study showed that there is a positive relationship between interaction management and customer satisfaction and retention. Similarly, Gangrade and Jain (2018) assessed the factors affecting customer retention in banks: an empirical study. The study revealed that interaction management has a positive and significant impact on customer satisfaction and retention. Likewise, Sivaprasad (2019) demonstrated that interaction management has a positive impact on customer satisfaction and customer retention. Based on it, the study develops following hypothesis:

H₄: There is a positive relationship of interaction management on customer satisfaction and customer retention.

Customer focus

Nyamweya and Osieko (2022) examined the influence of customer retention strategy on competitiveness of audit firms in Kenya. The study stated that customer focus has a positive and significant impact on customer satisfaction and customer retention. Similarly, Kavulya *et al.* (2018) assessed the effect of customer focus strategy on the performance of Saccos in Kenya. The study showed a positive impact of customer focus on customer satisfaction. Likewise, Madhani (2020) revealed that there is a positive and significant impact of customer focus on customer retention. Further, Almohaimmeed (2019) showed that customer focus has a positive and significant impact on customer satisfaction and customer retention. Based on it, the study develops following hypothesis:

H₅: There is a positive relationship of customer focus on customer satisfaction and customer 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 mean and standard deviation has been computed and the results are presented in Table 1.

Table 1

Kendall Tau's correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent variables and independent variables. The correlation coefficients are based on 187 observations. The dependent variables are CS (Customer satisfaction) and CR (Customer retention). The independent variables are SQ (Service quality), EB (Employees' behavior), CH (Complaints handling), IM (Interaction management), and CF (Customer focus).

Variables	Mean	S.D.	CS	CR	SQ	EB	CH	IM	CF
CS	4.843	0.312	1						
CR	4.837	0.315	0.559**	1					
SQ	4.867	0.179	0.239**	0.236**	1				
EB	4.684	0.460	0.258**	0.263**	0.258**	1			
CH	4.733	0.301	0.365**	0.371**	0.197**	0.539**	1		
IM	4.740	0.356	0.369**	0.313**	0.147*	0.438**	0.618**	1	
CF	4.754	0.310	0.373**	0.322**	0.169*	0.478**	0.481**	0.561**	1

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

Table 1 shows that service quality is positively correlated to customer satisfaction. It indicates that rising service quality precedes rising customer satisfaction. Similarly, employees' behavior is positively correlated to customer satisfaction. It indicates that good behavior of staffs leads to increase in consumer satisfaction. Likewise, complaints handling is positively correlated to customer satisfaction. It indicates that responding to consumer complaints more quickly increases customer satisfaction. Further, interaction management is also positively correlated to customer satisfaction. It indicates that greater customer engagement leads to increase in customer satisfaction. In addition, customer focus is positively correlated to customer satisfaction. It indicates that meeting customer demands lead to

increase in the levels of customer satisfaction.

Similarly, service quality is positively correlated to customer retention. It indicates that rising service quality precedes rising customer retention. Similarly, employees' behavior is positively correlated to customer retention. It indicates that good behavior of staffs leads to increase in consumer retention. Likewise, complaints handling is positively correlated to customer retention. It indicates that responding to consumer complaints more quickly increases customer retention. Further, interaction management is also positively correlated to customer retention. It indicates that greater customer engagement leads to increase in customer retention. In addition, customer focus is positively correlated to customer retention. It indicates that meeting customer demands lead to increase in the levels of customer retention.

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 service quality, employees' behavior, complaint handling, interaction management and customer focus on customer satisfaction.

Table 2

Estimated regression results of service quality, employees' behavior, complaint handling, interaction management and customer focus on customer satisfaction

The results are based on 187 observations using linear regression model. The model is $CS = \beta_0 + \beta_1 SQ + \beta_2 EB + \beta_3 CH + \beta_4 IM + \beta_5 CF + e$, where the dependent variable is CS (Customer satisfaction). The independent variables are SQ (Service quality), EB (Employees' behavior), CH (Complaints handling), IM (Interaction management), and CF (Customer focus).

Model	Intercept	Regression coefficients of					Adj. R ²	SEE	F-value
		SQ	EB	CH	IM	CF			
1	1.780 (3.060)**	0.620 (5.26)**					0.120	0.290	27.560
2	3.114 (15.82)**		0.360 (8.830)**				0.290	0.260	78.000
3	0.659 (3.475)**			0.884 (22.115)**			0.724	0.164	489.066
4	1.851 (8.716)**				0.631 (14.130)**		0.516	0.217	199.687
5	0.639 (3.780)**					0.884 (24.900)**	0.769	0.150	620.347
6	1.468 (2.882)**	0.381 (3.484)**	0.325 (7.646)**				0.333	0.255	47.423
7	0.146 (0.438)	0.127 (1.779)	0.039 (1.225)	0.823 (16.424)**			0.729	0.162	167.708
8	0.100 (0.298)	0.137 (0.078)	0.038 (1.172)	0.758 (9.890)**	0.066 (1.107)		0.729	0.162	126.242
9	0.027 (0.093)	0.102 (0.656)	0.002 (0.069)	0.377 (4.658)**	0.022 (0.421)	0.564 (8.111)**	0.800	0.139	150.107

Notes:

- Figures in parenthesis are t-values.
- The asterisk signs (**) and (*) indicates 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 service quality are positive with customer satisfaction. It indicates that service quality has a positive impact on customer satisfaction. This finding is consistent with the findings of Afthanorhan *et al.* (2019). Similarly, the beta coefficients for employees' behavior are positive with customer satisfaction. It indicates that employees' behavior has a positive impact on customer satisfaction. This finding is consistent with the findings of Agatep and Villalobos

(2021). Likewise, the beta coefficients for complaints handling are positive with customer satisfaction. It indicates that complaints handling has a positive impact on customer satisfaction. This finding is consistent with the findings of Susanti (2021). Further, the beta coefficients for interaction management are positive with customer satisfaction. It indicates that interaction management has a positive impact on customer satisfaction. This finding is consistent with the findings of Iyadi and Chiyem (2022). In addition, the beta coefficients for customer focus are positive with customer satisfaction. It indicates that customer focus has a positive impact on customer satisfaction. This finding is consistent with the findings of Nyamweya and Osieko (2022).

Table 3 shows the regression results of service quality, employees' behavior, complaint handling, interaction management and customer focus on customer retention.

Table 3

Estimated regression results of service quality, employees' behavior, complaint handling, interaction management and customer focus on customer retention

The results are based on 187 observations using linear regression model. The model is $CR = \beta_0 + \beta_1 SQ + \beta_2 EB + \beta_3 CH + \beta_4 IM + \beta_5 CF + e$, where the dependent variable is CR (Customer retention). The independent variables are SQ (Service quality), EB (Employees' behavior), CH (Complaints handling), IM (Interaction management), and CF (Customer focus).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		SQ	EB	CH	IM	CF			
1	1.743 (2.972)**	0.636 (5.278)**					0.126	0.294	27.857
2	3.366 (15.999)**		0.314 (7.027)**				0.206	0.280	49.385
3	0.664 (3.365)**			0.882 (21.206)**			0.707	0.170	449.712
4	1.971 (8.740)**				0.605 (12.742)**		0.465	0.230	162.351
5	0.637 (3.611)**					0.884 (23.863)**	0.753	0.156	569.419
6	1.488 (2.745)**	0.434 (3.736)**	0.264 (5.829)**				0.258	0.271	33.402
7	0.059 (0.169)	0.160 (2.160)*	0.045 (1.347)	0.890 (17.097)**			0.713	0.168	154.955
8	0.062 (0.177)	0.159 (2.128)*	0.045 (1.339)	0.894 (11.190)**	0.005 (0.077)		0.711	0.169	115.586
9	0.079 (0.268)	0.121 (1.928)	0.085 (2.970)**	0.472 (5.729)**	0.102 (1.922)	0.625 (8.836)**	0.797	0.142	147.239

Notes:

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

Table 3 shows that the beta coefficients for service quality are positive with customer retention. It indicates that service quality has a positive impact on customer retention. This finding is consistent with the findings of Abdirad and Krishnan (2022). Similarly, the beta coefficients for employees' behavior are positive with customer retention. It indicates that employees' behavior has a positive impact on customer retention. This finding is similar to the findings of Disse and Becker-Ozcamlica (2022). Likewise, the beta coefficients for complaints handling are positive with customer retention. It indicates that complaints handling has a positive impact on customer retention. This finding is consistent with the findings of Kuria and Muturi (2018). Further, the beta coefficients for interaction management are positive with customer retention. It indicates that interaction management has a positive impact on customer retention. This finding is similar to the findings of Gangrade and Jain (2018). In addition, the beta coefficients for customer focus are positive with customer retention. It

indicates that customer focus has a positive impact on customer retention. This finding is consistent with the findings of Almohaimmed (2019).

4. Summary and conclusion

Customer relationship management is crucial to a company's strategy. Sales representatives and clients have a stronger relationship when customer relationship management ensures that their customers return home satisfied and enhances their interactions with other consumers. In order to keep the relationship strong, the manager and business owner must develop engaging customer relationship management tactics. Understanding the several aspects that might affect customer satisfaction and retention increases sales revenue, boosts business organizations' profitability ratios, and aids in client retention.

This study attempts to examine the impact of customer relationship management on customer satisfaction and retention in the context of Nepalese enterprises. The study is based on primary data with 187 observations.

The major conclusion of this study is that service quality, employees' behavior, complaints handling, interaction management and customer focus have positive impact on customer satisfaction and customer retention. It indicates that higher the service quality, employees' behavior, customer handling, interaction management and customer focus, higher would be the customer satisfaction and customer retention. The study also concluded that customer focus followed by complaints handling is the most influencing factor that explains the changes in the customer satisfaction and customer retention.

References

- Abdelhamied, H. H. S., 2019. The impact of training activities on quality of service, customer satisfaction and behavioral intention. *Journal of Tourism and Hospitality Management* 7(1), 135-148.
- Abdirad, M., and K. Krishnan, 2022. Examining the impact of E-supply chain on service quality and customer satisfaction: a case study. *International journal of quality and service sciences* 14(2), 274-290.
- Afthanorhan, A., Z. Awang, N. Rashid, H. Foziah, and P. Ghazali, 2019. Assessing the effects of service quality on customer satisfaction. *Management Science Letters* 9(1), 13-24.
- Agatep, J. L. E., and R. N. Villalobos, 2021. Impact of employee behavior to customer satisfaction among selected establishments in Zambales, Philippines. *Science Insights* 36(2), 244-251.
- Agnihotri, R., K. J. Trainor, O. S. Itani, and M. Rodriguez, 2017. Examining the role of sales-based CRM technology and social media use on post-sale service behaviors in India. *Journal of Business Research* 81, 144-154.
- Ahmad, F., G. Widén, and I. Huvila, 2020. The impact of workplace information literacy on organizational innovation: An empirical study. *International Journal of Information Management* 51(40), 1-12.
- Ahrari, M., and R. Amirusefi, 2012. Survey relationship between service quality and customer relationship management. *Journal of American Science* 8(9), 220-227.
- Ali, B. J., B. Gardi, B. J. Othman, S. A. Ahmed, N. B. Ismael, P. A. Hamza, and G. Anwar, 2021. Hotel service quality: The impact of service quality on customer satisfaction in hospitality. *International Journal of Engineering, Business and Management* 5(3), 14-28.
- Almohaimmed, B., 2019. Pillars of customer retention: An empirical study on the influence of customer satisfaction, customer loyalty, customer profitability on customer retention. *Serbian Journal of Management* 14(2), 421-435.

- Al-Weshah, G. A., E. Al-Manasrah, and M. Al-Qatawneh, 2019. Customer relationship management systems and organizational performance: Quantitative evidence from the Jordanian telecommunication industry. *Journal of Marketing Communications* 25(8), 799-819.
- Babu, G., 2016. The evolution of customer relationship management (CRM)-Opportunities and challenges. *International Research Journal of Management Science and Technology* 7(8), 46-47.
- Disse, I. K., and H. Becker-Ozcamlica, 2022. The effects of employee behavior in sustainable service organizations. *Journal of Services Marketing* 36(8), 1095-1105.
- Filimonau, V., and M. Krivcova, 2017. Restaurant menu design and more responsible consumer food choice: An exploratory study of managerial perceptions. *Journal of Cleaner Production* 14(2), 516-527.
- Gangrade, S., and R. K. Jain, 2018. Factors affecting customer retention in banks: an empirical study. *Prestige International Journal of Management and Research* 10(4), 124-130.
- Hendricks, K. B., V. R. Singhal, and J. K. Stratman, 2007. The impact of enterprise systems on corporate performance: A study of ERP, SCM, and CRM system implementations. *Journal of Operations Management* 25(1), 65-82.
- Iyadi, D., and R. Chiyem, 2022. Customer relationship management and its effect on business growth: a focus on microfinance banks in Delta State, Nigeria. *International Journal of Academic Accounting, Finance and Management Research (IJAAMR)* 6(7), 33-44.
- Kavulya, P. W., W. Muturi, G. Rotich, and K. Ogollah, 2018. Effect of customer focus strategy on the performance of Saccos in Kenya. *International Journal of Business Strategies* 3(1), 1-16.
- Kotler, P., 2000. From market driven to market driving. *European Management Journal* 18(2), 129-142.
- Kuria, J. K., and W. Muturi, 2018. Influence of customer retention strategies on performance of commercial banks in Kenya. *International Journal of Social Sciences and Information Technology* 4(10), 420-433.
- Lambert, D. M., and M. G. Enz, 2017. Issues in supply chain management: Progress and potential. *Industrial Marketing Management* 62, 1-16.
- Madhani, P. M., 2020. Building a customer focused strategy: developing conceptual frameworks and research propositions. *SCMS Journal of Indian Management* 17(3), 5-25.
- Mahato, S., and J. Goet, 2020. Service quality, customer satisfaction and customer loyalty in Nepalese restaurant industry. *International Journal of Innovative Science and Research Technology* 5(12), 765-778.
- Meng, J. G., and K. M. Elliott, 2008. Predictors of relationship quality for luxury restaurants. *Journal of Retailing and Consumer Services* 15(6), 509-515.
- Nazar, N., S. Jahan, A. Amoozegar, T. Anjum, and V. Raju, 2020. The effects of total quality management practices on corporate social responsibility using the supply chain model: A review of the Malaysian hotel industry. *International Journal of Supply Chain Management* 9(5), 294-304.
- Nazar, N., S. R. Ramzani, T. Anjum, and I. A. Shahzad, 2018. Organizational performance: The role of TQM practices in the banking sector of Pakistan. *European Scientific Journal* 14(31), 278-302.
- Ngai, E. W. T., 2015. Customer relationship management research: An academic literature review and classification. *Marketing Intelligence and Planning* 23(6), 582-605.
- Nkrumah, N. K. E., O. Ernest, A. L. Serwah, and O. A. Anaba, 2019. Examining complaint handling processes among Ghanaian rural banks and its influence on customer satisfaction. *International Journal of Economics, Business and Management Studies* 6(2), 285-297.
- Nyamweya, T., and O. M. Osieko, 2022. Influence of customer retention strategy on competitiveness of audit firms in Kenya. *International Academic Journal of Human Resource and Business Administration* 3(10),

407-422.

- Prasilowati, S. L., S. Suyanto, J. Safitri, and M. K. Wardani, 2021. The impact of service quality on customer satisfaction: The role of price. *The Journal of Asian Finance, Economics and Business* 8(1), 451-455.
- Rao, T. A., D. V. Raju, and T. Anjum, 2020. A mediating role of adaptive selling behavior: Relationship between emotional intelligence and sales performance in the beverage industry of Pakistan. *International Journal of Psychosocial Rehabilitation* 24(1), 5266-5275.
- Sah, G. K., 2023. Consumers' attitude towards online shopping in Kathmandu valley. *Rajarshi Janak University Research Journal* 1(2), 120-129.
- Shrestha, S. K., 2023. Online shopping attitude and purchase intention of Nepalese consumers: Moderated mediation of social media. *Journal of Nepalese Management Academia* 1(1), 17-26.
- Sivaprasad, B., 2019. A study on CRM strategy on customer satisfaction and customer retention special reference with departmental stores in Chennai. *Think India Journal* 22(14), 8606-8615.
- Susanti, E., 2021. Complaints handling satisfaction mediates between complaints handling to customer loyalty for the Indonesian banking industry. *International Journal of Digital Entrepreneurship and Business* 2(2), 86-96.
- Thaichon, P., G. Liyanaarachchi, S. Quach, S. Weaven, and Y. Bu, 2019. Online relationship marketing: Evolution and theoretical insights into online relationship marketing. *Marketing Intelligence and Planning* 38(6), 676-698.
- Tiwana, A., 2001. A design knowledge management system to support collaborative information product evolution. *Decision Support Systems* 31(2), 241-262.
- Xing, L., and S. N. Devasia, 2019. The influence of customer relationship management on customer retention in the insurance sector, Malaysia. *INTI Journal* 19(10), 45-60.
- Zeithaml, V. A., L. L. Berry, and A. Parasuraman, 1996. The behavioral consequences of service quality. *Journal of Marketing* 60(2), 31-46.

Chapter 24

Influence of Information Technology on Consumer Decision-Making in Kathmandu Valley

Samundra Bhandari*

Abstract

The study examines the influence of information technology on consumer decision-making in Kathmandu Valley. Consumer decision making is selected as the dependent variable. The selected independent variables are digital advertisement, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth. The primary source of data is used to assess the opinion of respondents regarding digital advertisement, social media marketing, personalization, email marketing, search engine marketing, electronic word of mouth and consumer decision making in. The study is based on primary data of 176 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation and multiple regression models are estimated to test the significance and importance of influence of information technology on consumer decision-making in Kathmandu Valley.

The study showed that digital advertising has a positive impact on consumer decision making. It indicates that better digital advertisements influence the consumer decision. Similarly, social media marketing has a positive impact on consumer decision making. It indicates that effective social media marketing efforts influences consumer decision making. Likewise, personalization has a positive impact on consumer decision making. It indicates that personalized recommendations stimulate the consumer decision making. Further, email marketing has a positive impact on consumer decision making. It indicates that email marketing campaigns drives the consumer purchase intentions. In addition, search engine marketing has a positive impact on consumer decision making. It indicates that better use of search engine marketing stimulates the consumer decision makings. Moreover, electronic word of mouth has a positive impact on consumer decision making. It indicates that increase in positive electronic word of mouth stimulate the consumer decision making.

Keywords: digital advertising, social media marketing, personalization, email marketing, search engine marketing, electronic word of mouth, consumer decision making

1. Introduction

The rapid advancement of information technology has transformed the marketing landscape, presenting both opportunities and challenges for businesses in utilizing tools such as email marketing, personalization, digital advertising, search engine marketing, and electronic word of mouth (eWOM). While these IT-driven marketing strategies offer powerful means to influence consumer decision-making, many organizations struggle to effectively integrate and optimize these technologies within their marketing frameworks. This issue is particularly pronounced in varying market contexts where technological infrastructure, digital literacy, and consumer behavior differ significantly, leading to disparities in marketing effectiveness and consumer engagement. Email marketing remains a critical tool for businesses to reach consumers directly (Shivinski and Dabrowski, 2016). Similarly, the use of information technology in marketing has given organizations a new way of dealing and changing the buying behavior of the consumers. Information technology in marketing covers various dimensions such as search engine optimization, search engine marketing, email marketing, social media marketing,

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

web-based personalization's and many other forms which help catching the eye and pertain directly to potential consumers. Social media platforms also play a crucial role by offering a space for peer reviews and influencer endorsements that shape consumer opinions and choices (Mangold and Faults, 2020). Furthermore, mobile technology and apps facilitate on-the-go shopping and instant access to product information, enhancing convenience and accessibility (Shankar and Balasubramanian, 2019). Artificial intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems and encompasses a set of computational techniques inspired by the way humans use their nervous system to perceive, learn, and act (Aldosari, 2020). Hence, contemporary AI and computational science trends are shifting towards human-centered AI, taking into account individuals' unique characteristics and contexts to mitigate biases that may arise in algorithm management and processing (Yang *et al.*, 2021). Likewise, the emergence of AI represents a pivotal milestone in the realm of technological progress, ushering in a new era of transformative changes across industries, societies, and global dynamics (Doroudi, 2022). In general, AI stands as a prime example of a burgeoning technological advancement that frequently originates within esteemed academic institutions. Concomitantly, the emergence of new technological breakthroughs has created an environment conducive to fostering innovation and transformation within higher education institution (Okunlaya *et al.*, 2023). Furthermore, artificial intelligence is the simulation of human intelligence operations by computers, specifically computer systems. AI excels at specific tasks and changes almost every sector of a country's economy by allowing computers to make sound decisions that lead to more efficient operations (Limna, 2022).

Pejic *et al.* (2017) stated that business intelligence systems (BISs) refer to a wide range of technologies and applications useful for retrieving and analyzing a large amount of information with the goal to generate knowledge useful for making effective business decision. Business intelligence systems (BISs) are used to analyze information with the goal to acquire valuable data, information and knowledge which could improve the quality of management decision making across different business processes. According to Fang *et al.* (2018), with the continuous growth of mobile devices and technologies and the great potential of mobile BI in organizational decision-making, it shows that user acceptance and usage behavior are important aspects in determining BI success in organization. The technology, the user group, and the organizational context are all new to IT acceptance/adoption research (Hu *et al.*, 1999). Davis *et al.* (1989) investigated technology acceptance model (TAM) and introduced the concepts of perceived usefulness (PU) and perceived ease of use (PEOU) as key determinants of users' acceptance of information technology. The study showed that perceived usefulness and perceived ease of use are significant factors influencing user acceptance of information technology. Further, Tam *et al.* (1999) investigated the factors influencing physicians' acceptance and use of the technology. The study found that subjective norm, representing the influence of colleagues and peers had a notable impact on physician acceptance of telemedicine technology. Similarly, Gefen and Straub (2000) investigated the role of perceived ease of use in the adoption of Information Systems (IS), specifically focusing on the context of e-commerce adoption. The study showed that perceived ease of use had a stronger impact on adoption intentions among potential adopters than among actual adopters of e-commerce. Moreover, Venkatesh and Davis (2000) found that social influence and facilitating conditions had varying impacts on user acceptance depending on the specific context and stage of adoption.

Alhashmi *et al.* (2019) found Technology Acceptance Model (TAM) can be extended to capture the acceptance of AI technology in this context and identified factors such as perceived usefulness, perceived ease of use, social influence, facilitating conditions, and trust as important determinants of AI acceptance in the UAE healthcare sector, highlighting the significance of these factors in driving the successful implementation of AI technology in healthcare settings. Na *et al.* (2022) found that the technology acceptance model (TAM) combined with the Technology-Organization-Environment (TOE)

framework provides a comprehensive understanding of AI technology adoption in the construction industry. The study showed that perceived usefulness, perceived ease of use, organizational support, and external factors such as competitive pressure and government support significantly influence the intention to adopt AI-based technologies. Hyder (2010) emphasized the integration of IT and social media, advocating for data-driven approaches to build meaningful connections with customers, citing examples of successful digital engagement strategies. Goldfarb and Tucker (2011) analyzed the economic implications of IT on marketing dynamics, exploring how digital advertising and online platforms have reshaped market structures and consumer behavior. These perspectives collectively highlight the multifaceted relationship between IT and marketing, guiding businesses to navigate the digital landscape effectively while leveraging technology to drive meaningful engagement and business growth.

Johnson and Lee (2022) explored how a wide range of companies that provide AI solutions offer insightful perspectives on integrating AI into HR. The study also emphasized the rise of notable companies creating their own AI solutions in a variety of industries. The study highlighted that although artificial intelligence (AI) has been around for a while, current developments in technology have made it easier to use and maintain (Brown, 2022). This study focuses on human resources, despite the fact that this topic area has several fascinating subfields. Meanwhile, real-world situations necessitate numerous comprehensive human ways. But there's no denying that artificial intelligence (AI) technology can help humans accomplish a variety of activities more quickly and effectively. According to Solomon (2020) examined how IT has redefined the traditional consumer decision-making process. The study described phenomena like “webrooming” and “showrooming,” where consumers leverage online and offline channels to optimize their buying decisions. The ease of accessing online reviews and price comparison tools significantly impacts consumer choices, making the decision-making process more dynamic and data-driven. According to Baum *et al.* (2019), the impact of social media campaigns on the success of new product introductions. The study found that campaign-related factors positively influenced consumers' attitude toward the new product, which led to a positive impact on purchase intention and recommendation behavior.

In the context of Nepal, Niroula *et al.* (2023) examined the impact of social media on the lifestyle of youths of Nepal. The study showed the impact of social media on the lifestyle of youths in Nepal, with a focus on its use as a worldwide networking platform that enables people to join and connect with each other. Thakur (2017) examined that social media the study found that social media is a valuable tool for sharing health information and is used for educational, promotional, and communication purposes in the health field. However, social media has both direct and indirect negative impacts on health, such as cyberbullying, depression, anxiety, sleep disorders, physical inactivity, and internet addiction. Sthapit and Khadka (2016) found that constant rise in the use of social media by travel intermediaries in communicating about product and price, which customers also most look for the respond to. Facebook alone and Facebook in combination with other social media were most popular among both intermediaries and customers: and SMSs are influential in making most customers buy the mixed category of travel product. Bhandari (2021) discussed the impact of eWOM on purchasing behavior, noting its importance in the digital age. However, the specific dynamics of eWOM in Nepal, such as the credibility of sources, the impact of negative versus positive reviews, and the role of influencers, remain under-researched. Understanding these dynamics can help businesses leverage eWOM to build brand reputation and trust.

The above discussion shows that empirical evidences vary greatly across the studies concerning on influence of information technology on consumer decision-making. 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 influence of information technology on consumer decision-making in Kathmandu Valley. Specifically, it examines the relationship of digital advertisement, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth with consumer decision making 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 176 respondents through questionnaire. The study is based on convenience sampling method. The respondents' views were collected on digital advertisements, social media marketing, personalization, email marketing search engine marketing, electronic word of mouth and consumer's decision making. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that consumer decision-making depend upon various information technology factors. The dependent variable selected for the study is consumer's decision making. Similarly, the selected independent variables are digital advertisements, social media marketing, personalization, email marketing search engine marketing and electronic word of mouth. Therefore, the model takes the following form.

$$CDM = \alpha + \beta_1 DA + \beta_2 SMM + \beta_3 PZA + \beta_4 EM + \beta_5 SEM + \beta_6 EWOM + \varepsilon$$

Where

CDM = Consumer decision making

DA = Digital advertisements

SMM = Social media marketing

PZA = Personalization

EM = Email marketing

SEM = Search engine marketing

EWOM = Electronic word of mouth

Consumer decision making was measured using a 5-point Likert scale where 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 from brands that have a strong presence on IT platforms", "The availability of information about a company or brand through its website or online platforms influences my decision to consider it" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.932$).

Digital advertisements 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 "Digital advertisements are effective in influencing my purchasing

decisions”, “After seeing digital advertisements, I tend to make purchase decisions sooner than I originally planned” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.914$).

Social media marketing 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 “Recommendations or endorsements from social media influencers affect my intention to purchase products/services”, “I trust information shared on social media platforms when making purchasing decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.898$).

Personalization 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 “Personalized recommendations influence my purchase decisions”, “I am more likely to engage with and purchase from brands that offer personalized experiences” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.896$).

Email marketing 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 “Email offers and promotions influence my purchase decisions”, “I trust the information presented in marketing emails when making purchasing decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.963$).

Search engine marketing towards using ride sharing apps 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 prefer clicking on search engine ads that lead to landing pages relevant to my search intent”, “The ads shown in search engine results are relevant to my search intent or what I am looking for”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.950$).

Electronic word of mouth towards using ride sharing apps 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 “Recommendations or reviews shared through eWOM have influenced my preferences for certain brands or products”, “I am more likely to purchase from brands that are recommended effectively through eWOM” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.930$).

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

Digital advertising

Digital advertising encompasses a wide array of online marketing efforts that leverage the internet to deliver promotional content to consumers. Chaffey and Ellis-Chadwick (2012) highlighted that digital advertising offers significant advantages over traditional advertising, including precise targeting, real-time analytics, and cost-effectiveness. Deighton and Kornfeld (2014) demonstrated that digital advertising significantly influences consumer behavior and purchase decisions. The study found that personalized and interactive advertisements are more effective in capturing consumer attention and driving conversions. Scholz and Smith (2016) revealed that ads on social media platforms can significantly influence buying behavior. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between digital advertising and consumer’s decision making.

Social media marketing

Gupta (2016) concluded that social media significantly impacts consumer purchase decisions. Similarly, Ghermandi and Sinclair (2019) described social media as a collection of software applications that allow users to generate and share content and information virtually. The study revealed that individuals search according to their needs and preferences, which directs their behavior towards specific products and services. Voramontri (2018) found that social media users' perceived decision-making to be easier and more enjoyable compared to those using other information sources, highlighting a positive impact of social media on consumer purchase behavior. Pietro and Eleonora Pantano (2012) concluded enjoyment is a key factor in using social networks as a tool for supporting purchase decisions and suggested a positive relationship between customer attitudes towards social media and their behavioral intentions. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between social media marketing and consumer's decision making.

Personalization

Shanahan *et al.* (2019) discovered that perceived personalization positively influences consumer brand engagement and brand attachment, which in turn enhances perceived quality and brand loyalty for brands advertised on Facebook. Similarly, Appel *et al.* (2020) demonstrated a positive relationship between personalized content and social media marketing activities in e-commerce. Yadav and Rahman (2017) showed that personalization positively affects consumer perceptions regarding e-commerce success. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between personalization and consumer decision making.

Email marketing

Email marketing involves sending promotional messages to a targeted group of consumers through email. Email marketing is a highly effective digital marketing strategy that allows businesses to communicate directly with consumers, delivering tailored content that drives engagement and sales (Ellis-Chadwick and Doherty, 2012). Chaffey and Smith (2013) highlighted that effective email campaigns can significantly increase brand awareness, customer retention, and conversion rates. Janssens *et al.* (2017) revealed that well-executed email campaigns can enhance customer loyalty and lifetime value. The study found that regular, meaningful communication through email strengthens the relationship between the brand and its customers, fostering trust and loyalty. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between email marketing and consumer's decision making.

Search engine marketing

Boughton (2005) stated that search engine marketing allows firms to target consumers by placing ads on search engines, has proven to be an effective audience acquisition strategy. Ghose and Yang (2009) demonstrated that personalized and targeted search engine marketing campaigns are more successful in attracting clicks and driving conversions. The study found that ads tailored to specific search queries and user demographics resulted in higher click-through rates and improved overall ad performance. Li (2010) concluded that consumers are more likely to engage with ads that closely match their search intent and provide a seamless user experience. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between search engine marketing and consumer's purchase decision.

Electronic word of mouth

Electronic word-of-mouth (eWOM) is defined as any positive or negative statement made by potential, actual or former customers about a product or company, which is disseminated to various audiences through the internet. Lopez and Sicilia (2014) found a positive relationship between consumers' internet experience and eWOM, indicating that more internet-savvy individuals are likely to participate in eWOM activities. Similarly, Hamdani and Maulani (2018) concluded that eWOM positively influences purchase intentions, noting that consumers often trust reviews and opinions from peers over traditional marketing communications. In today's hyper-connected world, online reviews are a vital form of eWOM. By actively engaging with influencers, companies can enhance eWOM, thereby increasing potential customer engagement with the brand (Srivastava *et al.*, 2021). Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between electronic word of mouth and consumer decision making.

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 variable and independent variables. The correlation coefficients are based on 176 observations. The dependent variable is CDM (Consumer decision making). The independent variables are DA (Digital advertising), SMM (Social media marketing), PZA (Personalization), EM (Email marketing), SEM (Search engine marketing), and EWOM (Electronic word of mouth).

Variables	Mean	S.D.	CDM	DA	SMM	PZA	EM	SEM	EWOM
CDM	4.155	0.797	1						
DA	4.217	0.805	0.603**	1					
SMM	4.061	0.844	0.580**	0.688**	1				
PZA	4.109	0.760	0.641**	0.636**	0.685**	1			
EM	3.817	1.092	0.598**	0.631**	0.640**	0.674**	1		
SEM	3.868	1.017	0.592**	0.619**	0.620**	0.645**	0.741**	1	
EWOM	4.086	0.800	0.647**	0.594**	0.604**	0.597**	0.571**	0.659**	1

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

Table 1 shows that digital advertisement is positively correlated to consumer decision making. It reveals that better digital advertisements influence the consumer decision. Similarly, social media marketing is positively correlated to consumer decision making. It indicates that effective social media marketing efforts influences consumer decision making. Likewise, personalization is positively correlated to consumer decision making. It indicates that personalized recommendations stimulate the consumer decision making. Further, email marketing is positively correlated to consumer decision making. It indicates that email marketing campaigns drives the consumer purchase intentions. In addition, search engine marketing is positively correlated to consumer decision making. It indicates that better use of search engine marketing stimulates the consumer decision makings. Moreover, electronic word of mouth is positively correlated to consumer decision makings. It indicates that increase in

positive electronic word of mouth stimulate the consumer decision making.

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 digital advertisement, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth on consumer decision making.

Table 2

Estimated regression results of digital advertisement, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth on consumer decision making

The results are based on 176 observations using linear regression model. The model is $CDM = \beta_0 + \beta_1 DA + \beta_2 SMM + \beta_3 PZA + \beta_4 EM + \beta_5 SEM + \beta_6 EWOM + e$, where the dependent variable is CDM (Consumer decision making). The independent variables are DA (Digital advertising), SMM (Social media marketing), PZA (Personalization), EM (Email marketing), SEM (Search engine marketing), and EWOM (Electronic word of mouth).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		DA	SMM	PZA	EM	SEM	EWOM			
1	0.953 (4.610)**	0.759 (15.761)**						0.586	0.513	248.399
2	1.308 (6.570)**		0.701 (14.603)**					0.548	0.536	213.235
3	0.444 (2.622)**			0.903 (22.298)**				0.739	0.407	497.186
4	(2.269)* (14.028)**				0.494 (12.124)**			0.455	0.589	146.998
5	(1.984)* (11.947)**					0.561 (13.515)**		0.509	0.558	182.646
6	0.961 (4.921)**						0.782 (16.666)**	0.613	0.496	277.755
7	0.775 (3.890)**	0.476 (6.290)**	0.701 (14.603)**					0.630	0.485	150.031
8	0.166 (0.999)	0.265 (4.231)**	0.034 (0.533)	0.666 (10.527)**				0.774	0.379	200.448
9	.0858 (4.044)**	0.270 (4.197)**	0.041 (0.612)	0.672 (10.189)**	0.016 (0.352)			0.773	0.38	149.602
10	0.161 (0.937)	0.250 (3.845)**	0.037 (0.553)	0.653 (9.821)**	0.076 (1.336)	0.102 (1.675)		0.775	0.378	121.507
11	0.067 (0.393)	0.185 (2.771)**	0.029 (0.445)	0.590 (8.655)**	0.058 (1.038)	0.041 (0.655)	0.203 (3.108)**	0.786	0.369	108.024

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.
- Consumer decision making is the dependent variable.

Table 2 shows that that the beta coefficients for digital advertising are positive with consumer decision making. It indicates that digital advertising has a positive impact on consumer decision making. This finding is consistent with the findings of Deighton and Kornfeld (2014). Similarly, the beta coefficients for social media marketing are positive with consumer decision making. It indicates that social media marketing has a positive impact on consumer decision making. This finding is similar to the findings Ghermandi and Sinclair (2019). Likewise, the beta coefficients for personalization are positive with consumer decision making. It indicates that personalization has a positive impact on consumer decision making. This finding is consistent with the findings of Yadav and Rahman (2017). Further, the beta coefficients for email marketing are positive with consumer decision making. It indicates that email marketing has a positive impact on consumer decision making. This finding is consistent with the findings of Janssens *et al.* (2017). In addition, the beta coefficients for search engine

marketing are positive with consumer decision making. It indicates that search engine marketing has a positive impact on consumer decision making. This finding is consistent with the findings of Ghose and Yang (2009). Moreover, the beta coefficients for electronic word of mouth are positive with consumer decision making. It indicates that electronic word of mouth has a positive impact on consumer decision making. This finding is similar to the findings of Hamdani and Maulani (2018).

4. Summary and conclusion

Information-based social impacts have an impact on how consumers evaluate products and make decisions. Through peer communication, social media offers a new avenue for obtaining product information. Over the past few years, companies have had a noticeable impact on internet networks. Social media platforms offer businesses the chance to communicate and interact with prospective customers, foster a closer bond with them, and establish vital connections with them. Companies must set themselves apart through their corporate identity or brand image in order to convey the unique benefits and positioning of their products. Social networks in the online world allow businesses to aggressively push one competitive advantage, according to several marketers. The use of information technology in marketing has given organizations a new way of dealing and changing the buying behavior of the consumers. Information technology in marketing covers various dimensions such as search engine optimization, search engine marketing, email marketing, social media marketing, web-based personalization's and many other forms which help catching the eye and pertain directly to potential consumers. Social media platforms also play a crucial role by offering a space for peer reviews and influencer endorsements that shape consumer opinions and choices.

This study attempts to examine the influence of information technology on consumer decision-making in Kathmandu Valley. The study is based on primary sources of data with 176 respondents.

The major conclusion of the study is that digital advertisements, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth have positive impact on consumer decision making. It indicates that effective digital advertisements, social media marketing, personalization, email marketing, search engine marketing and electronic word of mouth lead to change in the perception of consumers regarding the purchase decisions. The study also concluded that personalization followed by electronic word of mouth is the most influencing factor that explains the consumer decision making.

References

- Aldosari, S., 2020. The future of higher education in the light of artificial intelligence transformations. *International Journal of Higher Education* 9(3), 145-167.
- Alhashmi, S. F., S. A. Salloum, and C. Mhamdi, 2019. Implementing artificial intelligence in the United Arab Emirates healthcare sector: An extended technology acceptance model. *Int. J. Inf. Technol. Lang. Stud* 3(3), 27-42.
- Appel, G., L. Grewal, R. Hadi, and A. T. Stephen, 2020. The future of social media in marketing. *Journal of the Academy of Marketing Science* 48(1), 79-96.
- Baum, D., M. Spann, J. Füller, and C. Thürridl, 2019. The impact of social media campaigns on the success of new product introductions. *Journal of Retailing and Consumer Services* 5(2), 289-297.
- Bhandari, A., 2021. The impact of electronic word of mouth (eWOM) on consumer purchasing behavior: A study of dynamics in Nepal. *Journal of Digital Marketing* 8(2), 112-125.
- Boughton, S. B., 2005. Search engine marketing. *Perspectives in Business* 2(1), 29-33.

- Brown, K., 2022. AI in human resources: Trends and future directions. *HR Technology Review* 12(1), 23-34.
- Chaffey, D., and P. R. Smith, 2013. Email marketing excellence: Planning, execution and optimization. *Journal of Marketing Management* 29(5-6), 546-567.
- Darwin, S., and A. Haryanto, 2021. Islamic marketing as a personalization strategy: Insights from Indonesia. *Journal of Islamic Marketing* 12(1), 43-58.
- Davis, F. D., R. P. Bagozzi, and P. R. Warshaw, 1989. Perceived usefulness, Perceived ease of use, and user acceptance of information technology. *MIS Quarterly* 13(3), 319-340.
- Deighton, J., and L. Kornfeld, 2014. Interactivity's unanticipated consequences for marketers and marketing. *Journal of Interactive Marketing* 28(2), 99-110.
- Doroudi, S., 2022. The intertwined histories of artificial intelligence and education. *International Journal of Artificial Intelligence in Education* 12(1), 1-44.
- Ellis-Chadwick, F., and N. F. Doherty, 2012. Web advertising: New forms of communication on the internet. *European Journal of Marketing* 46(3/4), 348-369.
- Fang, L. Y., N. F. M. Azmi, Y. Yahya, H. Sarkan, N. N. A. Sjarif, and S. Chuprat, 2018. Mobile business intelligence acceptance model for organizational decision making. *Bulletin of Electrical Engineering and Informatics* 7(4), 650-656.
- Gefen, D., and D. W. Straub, 2000. The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. *Journal of the Association for Information Systems* 1(8), 1-30.
- Ghermandi, A., and M. T. Sinclair, 2019. Social media as a marketing tool: A literature review. *Journal of Marketing Communications* 25(2), 89-101.
- Ghose, A., and S. Yang, 2009. An empirical analysis of search engine advertising: Sponsored search in electronic markets. *Management Science* 55(10), 1605-1622.
- Goldfarb, A., and C. Tucker, 2011. Online display advertising: Targeting and obtrusiveness. *Marketing Science* 30(3), 389-404.
- Gupta, S., 2016. The influence of social media marketing on consumer purchase decisions. *Journal of Marketing Research* 53(2), 345-359.
- Hamdani, M. R., and H. Maulani, 2018. Influence of electronic word of mouth on consumer purchasing decisions. *Journal of Management and Marketing Review* 3(2), 45-56.
- Hu, P. J., P. Y. Chau, O. R. L. Sheng, and K. Y. Tam, 1999. Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of Management Information Systems* 16(2), 91-112.
- Hyder, A. S., 2010. Data-driven approaches to building customer connections. *Journal of Business Research* 63(4), 320-329.
- Janssens, W., B. Weijters, and G. Swinnen, 2017. The effectiveness of email marketing in relationship management. *Journal of Relationship Marketing* 16(2), 98-113.
- Johnson, K., and J. Lee, 2022. AI integration in human resources: Current trends and future prospects. *International Journal of Human Resource Management* 33(5), 945-962.
- Li, H., 2010. Effective SEM strategies: Keywords, ad copy, and landing pages. *Journal of Digital Marketing* 9(3), 209-224.
- Limna, P., S. Jakwatanatham, S. Siripipattanakul, P. Kaewpuang, and P. Sriboonruang, 2022. A review of artificial intelligence (AI) in education during the digital era. *Journal of Advance Knowledge for Executives* 1(1),

1-9.

- Lopez, C., and M. Sicilia, 2014. The role of consumer knowledge and familiarity with eWOM. *Journal of Interactive Marketing* 28(1), 22-36.
- Mangold, W. G., and D. J. Faulds, 2020. Social media: The new hybrid element of the promotion mix. *Business Horizons* 63(3), 391-400.
- Na, S., S. Heo, S. Han, Y. Shin, and Y. Roh, 2022. Acceptance model of artificial intelligence (AI)-based technologies in construction firms: Applying the technology acceptance model (TAM) in combination with the Technology–Organization–Environment (TOE) framework. *Buildings* 12(2), 90-112.
- Niroula, B., and J. P. Upadhaya, 2023. Impact of social-media on the lifestyle of youths in Nepal. *Economics and Digital Business Review* 4(1), 889-897.
- Pejic Bach, M., J. Zoroja, and A. Celjo, 2017. An extension of the technology acceptance model for business intelligence systems: Project management maturity perspective. *International Journal of Information Systems and Project Management* 5(2), 5-21.
- Pietro, L., and E. Pantano, 2012. The impact of social networks on consumer purchasing decisions. *Journal of Interactive Marketing* 26(2), 102-114.
- Poudel, S., 2020. The growing importance of search engine marketing in Nepal. *Nepal Journal of Marketing* 7(1), 29-45.
- Scholz, M., and M. Smith, 2016. Social media advertising and consumer behavior. *Journal of Advertising Research* 56(3), 267-280.
- Shanahan, J., X. Zhang, and Y. Wang, 2019. The effects of personalization on consumer engagement and brand loyalty. *Journal of Marketing* 83(3), 88-101.
- Shankar, V., and S. Balasubramanian, 2019. Mobile technology and consumer behavior: Implications for marketers. *Journal of Retailing* 95(4), 86-102.
- Shivinski, P., and T. Dabrowski, 2016. *Email marketing: The ultimate guide to building a successful campaign*. *Marketing Journal* 12(4), 45-56.
- Sthapit, A., and I. Khadka, 2016. Social media marketing in Nepal: A study of travel intermediaries of the Kathmandu Valley. *PYC Nepal Journal of Management* 9(1), 29-43.
- Tam, C., D. Santos, and T. Oliveira, 1999. Examining the technology acceptance model using physician acceptance of telemedicine technology. *Journal of Management Information Systems* 16(2), 91-112.
- Thakur, D. N., 2017. Social media: opportunity or threat to public health in context of Nepal. *Health Prospect* 16(1), 7-9.
- Venkatesh, V., and F. D. Davis, 2000. A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science* 46(2), 186-204.
- Voramontri, P., 2018. The impact of social media on decision-making: The case of Facebook. *Asian Journal of Social Science* 46(1), 23-37.
- Yadav, M. S., and Z. Rahman, 2017. The impact of personalization on consumer perceptions and e-commerce success. *Journal of Retailing and Consumer Services* 39(1), 278-288.
- Yang, Y., Y. Zhuang, and Y. Pan, 2021. Multiple knowledge representation for big data artificial intelligence: framework, applications, and case studies. *Frontiers of Information Technology and Electronic Engineering* 22(12), 1551-1558.

Chapter 25

A Study on Existence of Overconfidence Biases among Nepalese Investors and Its Impact on Investment Decision

Kaushiki Pant*

Abstract

This study examines the existence of overconfidence biases among Nepalese investors and its impact on investment decisions. Investment decision is selected as the dependent variable. The selected independent variables are over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion. The primary source of data is used to assess the opinions of the respondents regarding over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control, loss aversion, and investment decision. The study is based on primary data of 203 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 existence of overconfidence biases among Nepalese investors and its impact on investment decision.

The study showed that overconfidence has a positive impact on investment decision. It indicates that presence of overconfidence biases in investors leads to better investment decision. Similarly, herding behaviour has a positive impact on investment decision. It indicates that herding behavior stimulates the investment decision. Likewise, conservatism has a negative impact on investment decision. It indicates that presence of conservatism bias among investors lead to poor investment decision. In addition, self-attribution has a positive impact on investment decision. It indicates that investors tend to make better investment decision if there is presence of self-attribution bias. Further, optimism has a positive impact on investment decision. It indicates that investment decision tends to improve if the investors are optimistic regarding the future. Likewise, financial literacy has a positive impact on investment decision. It indicates that increase in financial literacy leads to better investment decision. Moreover, risk tolerance has a positive impact on investment decision. It indicates that higher the risk tolerance, better would be the investment decision. In addition, illusion of control has a positive impact on investment decision. It indicates that higher the illusion of control better would be the investment decision.

Keywords: over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control, loss aversion, investment decision

1. Introduction

Investment is a commitment to placing funds or other resources for a certain period of time in the hope of obtaining benefits in the future. Investment is a sacrifice intentionally made by investor in the present days, by counting the risk involved, in order to obtain better returns in the future (Agyemang and Ansong, 2016). An investment decision is the process of deciding which assets to buy or sell in order to achieve a specified financial objective (Dash, 2010). This can include stocks, bonds, real estate, and other forms of investment. An investment choice is often made after examining a number of financial and economic aspects, including market trends, company financials, and risk-return tradeoffs. Investment is associated with return and risk, and both have unidirectional relationship. Investors must take into consideration all investment aspects in order to obtain the best return, and those aspects may include financial or nonfinancial information, and psychological factor, which all are needed in making optimum investment decision (Hoang, 2020).

* Ms. Pant is a Freelance Researcher, Kathmandu, Nepal.

A well-functioning securities market is conducive to the sustained economic growth of any country in the world (Levine and Ross, 2008). Overconfidence is the tendency of investors to react quickly to whatever comes their way without analyzing their decisions. Therefore, they will make decisions quickly and are very confident that the decisions they take are considered correct even without being based on sufficient information (Abreu and Mendes, 2012). Herding behavior is defined as other financial practitioners mimicking the behavior of one another. Similarly, Rahayu *et al.* (2021) examined the herding behavior model in investment decision on emerging markets in Indonesia. The study found a positive relationship between investment behavior and herding. A positive relationship between investment behavior and herding suggests that when individuals or institutions observe others making specific investment decisions, they are more likely to mimic these decisions rather than rely solely on their independent analysis or preferences. This phenomenon, called herding behavior, occurs due to psychological, social, or informational factors. Likewise, Cho and Choi (2016) examined the accounting conservatism and firms' investment decisions. The study observed that there is a higher negative relationship between accounting conservatism and over-investment in enterprises with limited managerial ownership and low foreign investment. Furthermore, Vaez and Baghi (2015) assessed the relationship between accounting conservatism and efficient investment. The study revealed that there is a negative association between investment and conservatism due to our managers' lack of specialization knowledge.

Likewise, Mahina *et al.* (2018) investigated the effect of self-attribution bias on investment in the Rwandan stock market. The study showed that there was a significant positive linear relationship between self-attribution bias and investment in Rwanda stock market. Saraskanrood and Ghafouri (2022) examined the effect of self-attribution bias on investor's behavior: mediating role of overconfidence bias in the capital market of Iran. The study concluded self-attribution has a significant effect on investor's behavior and a person who has a high self-attribution bias does not have a rational decision-making behavior. Moreover, Gautam *et al.* (2021) investigated the loss aversion, overconfidence and self-attribution: impact on individual investment decision. The study found that there is positive impact of self-attribution biases on investment decision. Likewise, Ullah *et al.* (2017) assessed the impact of overconfidence and optimism on investment decision. The study showed significant relationship between optimism and investment decision. Similarly, Arik and Sri (2021) investigated the effect of overconfidence and optimism bias on stock investment decisions with financial literature as moderating variable. The study concluded that optimism bias has a significant positive effect on stock investment decisions. Moreover, Riaz and Iqbal (2015) investigated the influence of overconfidence, illusion of control, self-control, and optimism bias on investor decision-making. The study discovered that optimism bias significantly enhances investing decisions. Furthermore, Arianti (2018) examined the influence of financial literacy, financial behavior and income on investment decision. The results of this study demonstrated that financial literacy has no significant impact on investment decisions. Likewise, Nugraha *et al.* (2022) evaluated the impact of financial literacy and behavior on investment decisions. The results of this study demonstrated that financial literacy has no significant impact on investment decisions.

Mubaraq *et al.* (2021) assessed the influence of financial knowledge and risk tolerance on investment decision making. The study found that risk tolerance has a positive effect on investment decision making. Similarly, Yulianis and Sulistyowati (2021) investigated the effect of financial literacy, overconfidence, and risk tolerance on investment decision. The study demonstrated that the risk tolerance variable has no meaningful effect on investment decisions. Likewise, Furthermore, Pufaa *et al.* (2023) examined the influence of financial literacy, overconfidence, and risk tolerance on student investment decisions in Palembang city. The study found that risk tolerance has no positive and significant effect. Moreover, Riaz and Iqbal (2015) examined the impact of overconfidence, illusion

of control, self-control and optimism bias on investor's decision making. The study observed that the illusion of control has a large and beneficial effect on investment decisions. The study's findings suggested that, in Pakistan, investors are biased while making investment decisions. Similarly, Qadri and Shabbir (2014) investigated an empirical study of overconfidence and illusion of control biases, impact on investor's decision making. The study demonstrated that the illusion of control has the greatest influence on behavior. Likewise, Ullah (2015) examined illusion of control and self-serving attribution bias and its impact on investor's decision making with moderating role of financial literacy. The study concluded that the illusion of control bias has significant positive impact on individual investor investment decision and no support were found for the positive impact of self-serving attribution bias on investment decision. Furthermore, Ainia et al. (2019) investigated the influence of risk perception, risk tolerance, overconfidence, and loss aversion towards investment decision making. The study concluded that loss aversion has no effect on investment decision making. Moreover, Mallik *et al.* (2017) examined the impact of overconfidence and loss aversion biases on investor decision making behavior with the mediating role of risk perception. The study found that loss aversion bias has a significant impact on investment decision.

In the context of Nepal, Giri and Adhikari (2023) examined the influence of conservatism and overconfidence on investment decisions among investors in Nepalese stock market. The results of the regression study revealed that Nepalese investors' conservatism has a significant favorable impact on their investment choices. The study also found that overconfidence played a minor effect on investment decisions, implying that investors do not exhibit overconfidence when investing in the stock market. Similarly, Lamichhane and Simkhada (2024) investigated on risk tolerance, overconfidence and investment decisions in Nepal. The study concluded that risk tolerance and overconfidence of stock investors have a significant and positive role in their investment decision-making process. Likewise, Rana (2024) investigated the impact of herding behavior on investment decisions in the Nepalese Stock Market with mediation and moderation effects. The findings showed that herding behavior improves both overconfidence and investment decisions. Overconfidence positively influences investment decisions. Financial literacy is a positive moderator, but overconfidence is a positive mediator between herding behavior and investing decisions. Subedi (2023) examined financial literacy and investment decisions in Nepalese Stock market. The findings of the study showed that positive and significant relationship between the dimensions of financial literacy and investment decisions in the Nepalese share market. Moreover, Dhakal and Lamsal (2023) assessed the impact of cognitive biases on investment decisions of investors in Nepal. The findings showed that cognitive biases can significantly affect Nepalese investors' investing decisions and may negatively impact their investment outcomes. Similarly, Sapkota (2022) examined behavioral finance and stock investment decisions. The study found that students' behavioral finance practices have a significant impact on their stock investment decisions.

The above discussion shows that empirical evidences vary greatly across the studies on the existence of overconfidence biases among investors and its impact on investment decisions. 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 existence of overconfidence biases among Nepalese investors and its impact on investment decisions. Specifically, it examines the relationship of over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion with investment decision in the context of Nepalese stock market.

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 203 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control, loss aversion and investment decision. The study is based on descriptive and causal comparative research designs.

The model

The model estimated in this study assumes that investment decision on stock depends upon different factors such as over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion. Therefore, the model takes the following form:

$$ID = \beta_0 + \beta_1 OB + \beta_2 HB + \beta_3 CB + \beta_4 SA + \beta_5 OT + \beta_6 FL + \beta_7 RT + \beta_8 IOC + \beta_9 LA + e$$

Where,

OB= Overconfidence bias

HB = Herding behavior

CB = Conservatism bias

SA = Self-attribution bias

OT = Optimism bias

FL = Financial literacy

RT= Risk tolerance

IoC= Illusion of control

LA= Loss aversion

ID = Investment decision

Investment decision 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 8 items and sample items include "I thoroughly analyze all available data before making investment decisions", "I consider both long-term and short-term outcomes when making investment decisions" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.916$).

Over 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 were 6 items and sample items include "I can do proper investment analysis and pick very good stocks", "I am sure that I can make correct investment decision" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.905$).

Herding behaviour 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 8

items and sample items include “I trust more in the opinions of financial analysts, friends, and family members compared to my own investment opinions”, “When I want to invest, I depend on other people’s investment decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.929$).

Conservatism 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 prefer to invest in familiar companies or industries rather than exploring new opportunities”, “I tend to stick to my initial investment decisions even when new information is available” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.887$).

Self-attribution bias 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 “The investment was more of a bad/ good luck than it was my own judgment”, “I attribute my investment successes to my knowledge and skills.” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.871$).

Optimism 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 6 items and sample items include “The future results of my investment will be surely positive”, “I usually buy the stocks in the trend of raising prices and sell stock in case of falling prices” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.884$).

Financial literacy 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 6 items and sample items include “I understand the basic concepts of risk and return when evaluating investment opportunities”, “I can easily interpret financial statements and reports to make informed investment decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.916$).

Risk tolerance 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 comfortable taking significant financial risks in pursuit of higher returns”, “I am willing to invest in assets that have a higher chance of losing value if the potential rewards are great” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.905$).

Illusion of control 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 was informed about all the fundamentals of the company that I am confident in making my investment”, “I feel that by choosing the right stocks, I can manage or avoid losses regardless of market conditions.” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.916$).

Loss aversion 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 6 items and sample items include “I intend to sell my investments immediately it goes back to the acquisition price”, “I sometimes fear investing on a share because of the feeling that the market could collapse” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.884$).

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

Overconfidence

Overconfidence can be explained as the tendency of investors to react quickly to whatever comes their way without analyzing their decisions. Gill et al. (2018) examined the factors effecting investment decision making behavior with the mediating role of information searches. The study revealed that overconfidence bias has positive and significant relationship with investment decision making behavior which remained significant when information search was added as mediator; suggesting a partial mediation in case of overconfidence. Likewise, Shabri and Sakir (2024) stated that overconfidence bias plays a significant influence in making optimal investing selections. Moreover, Poudel *et al.* (2024) concluded that overconfidence have a significant positive impact on investment decision making. Likewise, Robin and Angelina (2020) investigated the analysis of the impact of anchoring, herding bias, overconfidence and ethical consideration towards investment decision. The study found that overconfidence bias has positive and significant impact on investment decision. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between overconfidence and investment decision.

Herding behavior

Herding behavior in financial markets is identified as a tendency of investor behavior to follow other investors in decision making actions (Dar and Hakeem, 2015). Rahayu *et al.* (2021) examined the herding behavior model in investment decision on emerging markets in Indonesia. The study found a positive relationship between investment behavior and herding. Moreover, Adem and Sarioglu (2020) investigated the analysis of investors herding behavior in the context of Istanbul stock exchange. The study showed a positive relationship between investment behavior and herding. Likewise, Wang and Nuangjamnong (2022) examined the determinant factors of overconfidence, herding behavior, and investor elements on investment decision making in China. The study concluded that there is a significant relationship between herding behavior and investor sentiment. Moreover, Halim and Pamungkas (2023) examined the influence of risk perception, overconfidence, and herding behavior on investment decision. The study found that there is a positive influence of herding behavior on investment decision. Furthermore, Nareswari et al. (2021) examined the impact of behavioral aspects on investment decision making. The study found that herd behavior positively affects investment decision making. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between herding behavior and investment decision.

Conservatism

Giri and Adhikari (2023) examined the influence of conservatism and overconfidence on investment decisions among investors in Nepali stock market. The results showed that Nepali investors' conservatism had a significant favorable impact on their investment choices. The study also found that overconfidence played a minor effect in investment decisions, implying that investors do not exhibit overconfidence when investing in the stock market. Similarly, Cho and Choi (2016) investigated the accounting conservatism and firms' investment decisions. The study concluded that there is a higher negative relationship between accounting conservatism and over-investment in enterprises with limited managerial ownership and low foreign investment. Furthermore, Vaez and Baghi (2015) assessed the relationship between accounting conservatism and efficient investment. The study revealed that there is a negative association between investment and conservatism due to our managers' lack of specialization knowledge. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between conservatism and investment decision.

Self-attribution

Self-attribution bias reveals that people interpret success and failure differently: Individuals tend to attribute success to their own abilities. Mahina et al. (2018) investigated the effect of self-attribution bias on investment in the Rwandan stock market. The study showed that there was a significant positive linear relationship between self-attribution bias and investment in Rwanda stock market. Saraskanrood and Ghafouri (2022) examined the effect of self-attribution bias on investor's behavior: mediating role of overconfidence bias in the capital market of Iran. The study concluded self-attribution has a significant effect on investor's behavior and a person who has a high self-attribution bias does not have a rational decision-making behavior. Moreover, Gautam *et al.* (2021) investigated the loss aversion, overconfidence and self-attribution: impact on individual investment decision. The study found that there is positive impact of self-attribution biases on investment decision. Similarly, Naveed and Taib (2021) examined the overconfidence bias, self-attribution bias and investor decisions with the moderating role of information acquisition. The study revealed that behavioral biases (overconfidence bias and self-attribution bias) distort the rationality of individual investors' decision, and information acquisition significantly moderates the relationship of overconfidence bias with investor decisions. Based on that, this study formulates the following hypothesis:

H₄: There is a positive relationship between herding behavior and investment decision.

Optimism

Optimism is that bias in which investors are taking risks and assumes the future favorable, successful and ignores failures. The investors are affected by their optimistic behavior as they are taking risks and thinking that their decisions are right (Felton et al., 2003). Likewise, Iqbal (2015) investigated the impact of optimism bias on investing decisions using evidence from the Islamabad stock exchange in Pakistan. The study found that optimism bias has a substantial link with investment decisions. Furthermore, Shabri and Sakir (2024) suggested that optimism and prejudice play a significant impact in making optimal investment decisions. Moreover, Mahina et al. (2017) found a substantial positive linear connection between over-optimism bias and investment in the Rwandan stock market. Likewise, Ullah *et al.* (2017) assessed the impact of overconfidence and optimism on investment decision. The study showed significant relationship between optimism and investment decision. Similarly, Arik and Sri (2021) investigated the effect of overconfidence and optimism bias on stock investment decisions with financial literacy as moderating variable. The study concluded that optimism bias has a significant positive effect on stock investment decisions. Based on that, this study formulates the following hypothesis:

H₅: There is a positive relationship between optimism and investment decision.

Financial literacy

Arianti (2018) examined the influence of financial literacy, financial behavior and income on investment decision. The results of this study demonstrated that financial literacy has significant impact on investment decisions. The positive relationship between financial literacy and investment decision-making on stock implies that individuals with a higher level of financial literacy are more likely to make informed and confident decisions about investing in stocks. Likewise, Nugraha et al. (2022) evaluated the impact of financial literacy and behavior on investment decisions. The results of this study demonstrated that financial literacy has significant impact on investment decisions. Similarly, Gupta and Upadhyay (2022) investigated the impact of market information on students' investment behavior.

The study revealed that market information significantly affects students' investment behavior in the Nepalese stock market. Furthermore, Baihaqqy et al. (2020) assessed the effect of financial literacy on the investment decision. The study concluded that financial literacy is known to have a significant influence on investment decisions. Based on that, this study formulates the following hypothesis:

H₆: There is a positive relationship between financial literacy and investment decision.

Risk Tolerance

Risk tolerance is defined as the ability and capacity of an investor to accept and face risks when investing (Budiarto and Susanti, 2017). Nguyen *et al.* (2016) examined the influence of financial risk tolerance on investment decision-making in a financial advice context. The study found a significant relationship between client risk tolerance and investment decision-making. Likewise, Mubaraq *et al.* (2021) assessed the influence of financial knowledge and risk tolerance on investment decision making. The study found that risk tolerance has a positive effect on investment decision making. Furthermore, Lamichhane and Simkhada (2024) investigated on risk tolerance, overconfidence and investment decisions in Nepal. The result concluded that risk tolerance and overconfidence of stock investors have a significant and positive role in their investment decision-making process. Based on that, this study formulates the following hypothesis:

H₇: There is a positive relationship between risk tolerance and investment decision.

Illusion of control

Illusion of control occurs when individuals misinterpret the degree of control they have over situations and outcomes (Joseph, 2015). Illusion of control is a human tendency who believe they can control or influence outcomes but in reality, they cannot. Similarly, Riaz and Iqbal (2015) examined the impact of overconfidence, illusion of control, self-control and optimism bias on investor's decision making. The study found that optimism bias has significant positive impact on investment decision. Similarly, Qadri and Shabbir (2014) investigated an empirical study of overconfidence and illusion of control biases, impact on investor's decision making: evidence from ISE. The study demonstrated that the illusion of control has significant positive influence on behavior. Likewise, Ullah (2015) examined an empirical study of illusion of control and self-serving attribution bias, impact on investor's decision making with moderating role of financial literacy. The study concluded that the illusion of control bias has significant positive impact on individual investor investment decision and no support were found for the positive impact of self-serving attribution bias on investment. Moreover, Syariati *et al.* (2019) examined the impact of illusion of control, overconfidence and emotions on investment decisions made by young investors in the city of Makassar. The study found that illusion of control has a positive and significant effect on investment decisions. Based on that, this study formulates the following hypothesis:

H₈: There is a positive relationship between illusion of control and investment decision.

Loss aversion

Loss aversion is the tendency of people to strongly favor avoiding losses above earning gains. Loss aversion is a condition where a person is very risk-averse because he is reluctant to accept losses. Loss aversion is also a deviant behavior that is based on fear of loss which encourages excessive rejection of risks that can cause harm. Loss aversion variables are measured using indicators such as investment with clear losses, caution against losses, and investments with a high-performance history (Khan, 2017). Ainia et al. (2019) investigated the influence of risk perception, risk tolerance, overconfidence, and loss aversion towards investment decision making. The study concluded that loss

aversion has positive effect on investment decision making. Moreover, Mallik *et al.* (2017) examined the impact of overconfidence and loss aversion biases on investor decision making behavior using mediating role of risk perception. The study found that loss aversion bias has significant impact on investment decision. Based on that, this study formulates the following hypothesis:

H₉: There is a positive relationship between loss aversion and investment decision.

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 203 observations. The dependent variable is ID (Investment decision) and independent variables are Overconfidence bias (OB), Herding behavior (HB), Conservatism bias (CB), Self-attribution (SA), Optimism (OT), Financial literacy (FL), Risk tolerance (RT) Illusion of control (IOC) and Loss aversion (LA).

Variables	Mean	S.D.	ID	OB	HB	CB	SA	OT	FL	RT	IOC	LA
ID	3.719	0.954	1									
OB	3.521	1.002	0.552**	1								
HB	3.590	0.979	0.576**	0.646**	1							
CB	3.870	0.870	-0.641**	0.560**	0.573**	1						
SA	3.837	0.852	0.591**	0.569**	0.544**	0.638**	1					
OT	3.943	0.837	0.672**	0.491**	0.510**	0.651**	0.637**	1				
FL	3.653	0.957	0.583**	0.585**	0.620**	0.546**	0.565**	0.536**	1			
RT	3.809	0.933	0.671**	0.551**	0.548**	0.671**	0.662**	0.696**	0.592**	1		
IOC	3.728	0.909	0.547**	0.635**	0.606**	0.596**	0.578**	0.550**	0.588**	0.620**	1	
LA	3.933	0.821	0.631**	0.552**	0.468**	0.595**	0.572**	0.643**	0.512**	0.638**	0.542**	1

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

Table 1 shows that overconfidence bias is positively correlated to investment decision. It implies that presence of overconfidence bias drives the investment decision. Likewise, the result also reveals that herding behavior is positively correlated to investment decision. It reveals that herding behavior stimulates the investment decision. Moreover, conservatism bias is negatively correlated to investment decision indicating that presence of conservatism lead to decrease in investment decision. Furthermore, self-attribution is positively correlated to investment decision. It implies that the increase in self-attribution bias leads to increase in investment decision. Similarly, the result also reveals that optimism is positively correlated to investment decision indicating that availability of optimism stimulate the investment decision. In addition, financial literacy is positively correlated to investment decision. It reveals that financial literacy factor stimulates the investment decision. Similarly, risk tolerance is positively correlated to investment decision. It implies that increase in risk tolerance stimulates investment decision. The result also shows that illusion of control is positively correlated to investment decision. It implies that increase in illusion of control stimulates the investment decision. Likewise, loss aversion is positively correlated to investment decision. It indicates that presence of loss

aversion in investor stimulates the investment decision.

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 over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion on investment decision.

Table 2

Estimated regression results of over confidence, herding behavior, conservatism, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion on investment decision

The results are based on 203 observations using linear regression model. The model is $ID = \beta_0 + \beta_1 OB + \beta_2 HB + \beta_3 CB + \beta_4 SA + \beta_5 OT + \beta_6 FL + \beta_7 RT + \beta_8 IOC + \beta_9 LA + e$, where the dependent variable is ID (Investment decision) and independent variables are Overconfidence bias (OB), Herding behavior (HB), Conservatism bias (CB), Self-attribution (SA), Optimism (OT), Financial literacy (FL), Risk tolerance (RT) Illusion of control (IOC) and Loss aversion (LA).

Model	Intercept	Regression coefficients of									Adj. R_bar ²	SEE	F-value
		OB	HB	CB	SA	OT	FL	RT	IOC	LA			
1	1.475 (9.896)**	0.661 (17.029)**									0.589	0.526	289.98
2	1.919 (12.661)**		0.572 (13.813)**								0.484	0.589	190.801
3	2.081 (11.991)**			-0.516 (11.062)**							0.375	0.649	122.362
4	1.369 (7.288)**				0.663 (14.000)**						0.491	0.585	196.001
5	1.320 (6.979)**					0.681 (14.156)**					0.497	0.582	200.389
6	1.030 (5.591)**						0.736 (16.114)**				0.562	0.543	259.667
7	1.858 (10.847)**							0.568 (12.523)**			0.435	0.617	156.816
8	1.429 (8.827)**								0.657 (15.920)**		0.556	0.547	253.451
9	1.630 (9.135)**									0.618 (13.290)**	0.465	0.600	176.612
10	1.301 (8.921)**	0.475 (8.955)**	0.246 (4.857)**								0.630	0.499	173.086
11	1.343 (9.151)**	0.516 (9.014)**	0.317 (4.990)**	-0.123 (1.832)							0.634	0.496	117.869
12	1.189 (7.465)**	0.444 (6.928)**	0.283 (4.403)**	-0.157 (2.301)*	0.170 (2.364)*						0.643	0.490	91.837
13	1.067 (6.454)**	0.415 (6.430)**	0.248 (3.802)**	-0.181 (2.666)	0.103 (1.355)	0.183 (2.413)*					0.651	0.485	76.423
14	0.891 (5.371)**	0.305 (4.444)**	0.293 (4.573)**	-0.193 (2.939)	0.019 (0.244)	0.065 (0.816)	0.317 (3.872)**				0.674	0.468	70.707
15	0.884 (5.306)**	0.297 (4.280)**	0.282 (4.285)**	-0.208 (3.017)	0.020 (0.264)	0.060 (0.747)	0.310 (3.747)**	0.047 (0.724)			0.674	0.469	60.534
16	0.903 (5.442)**	0.274 (3.900)	0.273 (4.159)**	-0.207 (3.013)	-0.007 (-0.092)	0.034 (0.415)	0.270 (3.163)**	0.030 (0.461)	0.136 (1.779)		0.677	0.466	53.951
17	0.891 (5.321)**	0.278 (3.936)**	0.258 (3.702)**	-0.215 (3.073)	-0.10 (-0.134)	0.029 (0.351)	0.266 (3.103)**	0.026 (0.391)	0.126 (1.604)	0.048 (0.638)	0.676	0.467	47.855

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.
- Individual investment behavior is the dependent variable.

Table 2 shows that the beta coefficients for overconfidence bias are positive with investment decision. It indicates that overconfidence bias has a positive impact on investment decision. This

finding is similar to the findings of Shabri and Sakir (2024). Likewise, the beta coefficients for herding behavior are positive with investment decision. It indicates that herding behavior has a positive impact on investment decision. This finding is consistent with the findings of Rahayu *et al.* (2021). Moreover, the beta coefficients for conservatism are negative with investment decision. It indicates that conservatism has a negative impact on investment decision. This finding is similar to the findings of Cho and Choi (2016). Further, the beta coefficients for self-attribution are positive with investment decision. It indicates that self-attribution has a positive impact on investment decision. This finding is consistent with the findings of Naveed and Taib (2021). Likewise, the beta coefficients for optimism are positive with investment decision. It indicates that optimism has a positive impact on investment decision. This finding is similar to the findings of Iqbal (2015). In addition, the beta coefficients for financial literacy are positive with investment decision. It indicates that financial literacy has a positive impact on investment decision. This finding is similar to the findings of Baihaqqy *et al.* (2020). Likewise, the beta coefficients for risk tolerance are positive with investment decision. It indicates that risk tolerance has a positive impact on investment decision. This finding is consistent with the findings of Lamichhane and Simkhada (2024). Further, the beta coefficients for illusion of control are positive with investment decision. It indicates that illusion of control has a positive impact on investment decision. This finding is consistent with the findings of Riaz and Iqbal (2015). In addition, the beta coefficients for loss aversion are positive with investment decision. It indicates that loss aversion has a positive impact on investment decision. This finding is similar to the findings of Mallik *et al.* (2017).

4. Summary and conclusion

The stock market benefits investors because it provides opportunity for wealth creation. Well-functioning stock markets may help mobilize resources and investments, as well as organize the production of products and services that create jobs. Finally, this contributes to the country's overall economic development. Long-term investors contribute significantly to the economy's productive capacity. Individual investors play an important role in financial markets because they have preferences for company stocks based on risks, liquidity, returns, and other non-financial characteristics.

This study attempts to analyze the existence of overconfidence biases among Nepalese investors and its impact on investment decisions. The study is based on primary data with 203 observations.

The major conclusion of this study is that that overconfidence bias, herding behavior, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion have positive and significant impact on investment decision in Nepalese stock market. It indicates that investment decision would be better with greater overconfidence bias, herding behavior, self-attribution, optimism, financial literacy, risk tolerance, illusion of control and loss aversion. However, conservatism has negative and significant impact on investment decision in Nepalese stock market. It indicates that presence of conservatism bias among investors will lead to poor investment decision. In the context of Nepalese stock market, the study also found that the most significant factor explaining investment decision is overconfidence, followed by financial literacy.

References

- Abreu, M., and V. Mendes, 2012. Information, overconfidence, and trading: Do the sources of information matter? *Journal of Economic Psychology* 33(4), 868-881.
- Agyemang, O. S., and A. Ansong, 2016. Role of personal values in investment decisions: Perspectives of individual Ghanaian shareholders. *Management Research Review* 39(8), 940-964.
- Ainia, N. S. N., and L. Lutfi, 2019. The influence of risk perception, risk tolerance, overconfidence, and loss aversion towards investment decision making. *Journal of Economics, Business, and Accountancy*

Ventura 21(3), 401-413.

- Arianti, B. F., 2018. The influence of financial literacy, financial behavior, and income on investment decision. *Economics and Accounting Journal* 1(1), 1-10.
- Arik, S. L., and A. L. Sri, 2021. The effect of overconfidence and optimism bias on stock investment decisions with financial literacy as moderating variable. *Eurasia: Economics and Business* 12(54), 84-93.
- Baihaqqy, M. R. I., N. Disman, M. Sari, and S. Ikhsan, 2020. The effect of financial literacy on the investment decision. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)* 3(4), 3073-3083.
- Budiarto, A., and S. Susanti, 2017. Pengaruh financial literacy, overconfidence, regret aversion bias, dan risk tolerance terhadap keputusan investasi. *Jurnal Ilmu Manajemen (JIM)* 5(2), 1-9.
- Cho, J., and W. W. Choi, 2016. Accounting conservatism and firms' investment decisions. *Journal of Applied Business Research* 32(4), 1223-1236.
- Dar, F. A., and I. A. Hakeem, 2015. The influence of behavioural factors on investors' investment decisions: A conceptual model. *International Journal of Research in Economics and Social Sciences* 5(10), 51-65.
- Dhakal, S., and R. Lamsal, 2023. Impact of cognitive biases on investment decisions of investors in Nepal. *The Lumbini Journal of Business and Economics* 11(1), 35-48.
- Felton, J., B. Gibson, and D. M. Sanbonmatsu, 2003. Preference for risk in investing as a function of trait optimism and gender. *The Journal of Behavioral Finance* 4(1), 33-40.
- Gautam, C., T. V. Raman, and V. Kumar, 2021. Loss aversion, overconfidence and self-attribution: Impact on individual investment decision. *Journal of General Management Research* 8(1), 1-11.
- Gill, S., M. K. Khurshid, S. Mahmood, and A. Ali, 2018. Factors affecting investment decision-making behavior: The mediating role of information searches. *European Online Journal of Natural and Social Sciences* 7(4), 758-767.
- Giri, B., and S. Adhikari, 2023. The influence of conservatism and overconfidence on investment decisions among investors in Nepali stock market. *Journal of Emerging Management Studies* 1(1), 20-36.
- Gupta, P., and B. Upadhyay, 2022. Effect of market information on student's investment behavior. *Nepalese Journal of Business and Management Studies* 1(1), 83-92.
- Halim, R., and A. S. Pamungkas, 2023. The influence of risk perception, overconfidence, and herding behavior on investment decision. *International Journal of Application on Economics and Business* 1(1), 521-529.
- Hoang, L. T., T. T. Phan, and L. N. Ta, 2020. Nominal price anomaly in emerging markets: Risk or mispricing? *Journal of Asian Finance, Economics and Business* 7(9), 125-134.
- Iqbal, N., (2015). Impact of optimism bias on investment decision: Evidence from Islamabad stock exchange, Pakistan. *Research Journal of Finance and Accounting* 6(19), 74-79.
- Joseph, C. N., 2015. Illusion of control dan faktor demografidalam pengambilan keputusan investasi. *Jurnal Ekonomi* 9(2), 108-117.
- Khan, M. Z. U., 2017. Impact of availability bias and loss aversion bias on investment decision-making: Moderating role of risk perception. *Management and Administration (IMPACT: JMDGMA)* 1(1), 17-28.
- Lamichhane, P., and A. Simkhada, 2024. Risk tolerance, overconfidence and investment decisions in Nepal. *Journal of General Education and Humanities* 3(2), 227-240.
- Levine, R., and D. Ross, 2008. Stock market development and economic growth. *The World Bank Economic Review* 10(12), 323-339.

- Mahina, J. N., W. Muturi, and M. Florence, 2018. Effect of self-attribution bias on investment in the Rwandan stock market. *Global Journal of Management and Business Research* 18(2), 54-63.
- Mallik, K. A., M. A. Munir, and S. Sarwar, 2017. Impact of overconfidence and loss aversion biases on investor decision-making behaviour: Mediating role of risk perception. *International Journal of Public Finance, Law and Taxation* 1(1), 13-24.
- Mubaraq, M. R., M. Anshori, and H. Trihatmoko, 2021. The influence of financial knowledge and risk tolerance on investment decision-making. *Jurnal Ekonomi Bisnis Dan Kewirausahaan* 10(2), 140-146.
- Nareswari, N., A. S. Balqista, and N. P. Negoro, 2021. The impact of behavioural aspects on investment decision-making. *Jurnal Manajemen Dan Keuangan* 10(1), 15-27.
- Naveed, F., and H. M. Taib, 2021. Overconfidence bias, self-attribution bias and investor decisions: Moderating role of information acquisition. *Pakistan Journal of Commerce and Social Sciences* 15(2), 354-377.
- Nguyen, L., G. Gallery, and C. Newton, 2016. The influence of financial risk tolerance on investment decision-making in a financial advice context. *Australasian Accounting, Business and Finance Journal* 10(3), 3-22.
- Nugraha, R. K., A. P. Eksanti, and Y. O Haloho, 2022. The influence of financial literacy and financial behaviour on investment decision. *Jurnal Ilmiah Manajemen Dan Bisnis* 8(1), 68-77.
- Poudel, A., S. Bhusal, and D. D Pathak, 2024. Behaviour bias and investment decision in Nepalese investors. *International Journal of Business and Management* 19(2), 85-105.
- Pufaa, P. F. A., E. D. Purnamasari, and S. Lazuardi, 2023. The influence of financial literacy, overconfidence, and risk tolerance on student investment decisions in Palembang City. *ProBisnis: Jurnal Manajemen* 14(4), 154-162.
- Qadri, S. U., and M. Shabbir, 2014. An empirical study of overconfidence and illusion of control biases, impact on investor's decision making: Evidence from ISE. *European Journal of Business and Management* 6(14), 38-44.
- Rahayu, S., A. Rohman, and P. Harto, 2021. Herding behavior model in investment decision on emerging markets: Experimental in Indonesia. *Journal of Asian Finance, Economics and Business* 8(1), 053-059.
- Rana, B., 2024. Impact of herding behavior on investment decisions in the Nepalese stock market with mediation and moderation effects. *International Research Journal of MMC* 5(2), 64-77.
- Riaz, T., and H. Iqbal, 2015. Impact of overconfidence, illusion of control, self-control and optimism bias on investors' decision making: Evidence from developing markets. *Research Journal of Finance and Accounting* 6(11), 110-116.
- Robin, R., and V. Angelina, 2020. Analysis of the impact of anchoring, herding bias, overconfidence and ethical consideration towards investment decision. *JIMFE (Jurnal Ilmiah Manajemen Fakultas Ekonomi)* 6(2), 253-264.
- Sapkota, M. P., 2022. Behavioural finance and stock investment decisions. *Saptagandaki Journal* 13(13), 70-84.
- Saraskanrood, K., and N. Ghafouri, 2022. Social mood and financial economics. *The Journal of Behavioral Finance* 6(3), 144-160.
- Shabri, M., and A. Sakir, 2024. The effect of optimism bias and overconfidence on investment decisions in Aceh mediated by herding. *Calitatea* 25(198), 173-181.
- Subedi, D. P., 2023. Financial literacy and investment decisions in Nepalese share market. *Management Dynamics* 26(1), 11-20.
- Syariati, A., S. Sumarlin, and A. N. A. Ainun, 2019. The impact of illusion of control, overconfidence and emotions

on investment decisions made by young investors in the city of Makassar. *Jurnal Iqtisaduna* 7(1), 235-246.

Ullah, I., A. Ullah, and N. U. Rehman, 2017. Impact of overconfidence and optimism on investment decision. *International Journal of Information, Business and Management* 9(2), 231-243.

Ullah, S., 2015. An empirical study of illusion of control and self-serving attribution bias, impact on investor's decision making: Moderating role of financial literacy. *Research Journal of Finance and Accounting* 6(19), 109-118.

Vaez, S. A., and M. R. Baghi, 2015. The relationship between accounting conservatism and efficient investment. *Journal of Accounting Advances* 6(2), 167-195.

Wang, P., and C. Nuangjamnong, 2022. Determinant factors of overconfidence, herding behavior, and investor elements on investment decision making in China. *Universal Journal of Financial Economics* 1(1), 23-42.

Yulianis, N., and E. Sulistyowati, 2021. The effect of financial literacy, overconfidence, and risk tolerance on investment decision. *Journal of Economics, Business, and Government Challenges* 4(1), 61-71.

Chapter 26

Influence of Social Media Marketing on Customer Engagement in Kathmandu Valley

Shweta Poudel*

Abstract

The study examines the impact of social media marketing on customer engagement in Kathmandu Valley. Consumer engagement is selected as the dependent variable. The selected independent variables are customization, trust, product quality, customer awareness, attractiveness and content marketing. The study is based on primary data with 168 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 media marketing on customer engagement in the context of Kathmandu Valley.

The study showed that customization has a positive impact on customer engagement. It implies that increase in customized products or services leads to higher customer engagement. Similarly, trust has a positive impact on consumer engagement implying that higher level of trust in the brand or product enhances customer engagement. Additionally, customer awareness has a positive impact on customer engagement. It implies that increased awareness of the product or brand boosts customer engagement. In addition, the study showed that product quality has a positive impact on customer engagement. This means that the better product quality results in higher customer engagement. In addition, consumer awareness has a positive impact on customer engagement. It indicates that increasing awareness through advertising and social media leads to increase in customer engagement. Furthermore, content marketing has a positive impact on customer engagement. It shows that better content marketing leads to increase in customer engagement.

Keywords: consumer engagement, customization, trust, product quality, customer awareness, attractiveness, content marketing

1. Introduction

Social media has become an essential marketing tool for promoting a brand's products and services. It acts as a modern communication channel that significantly influences the relationship between a brand and its customers (Hsu, 2012). Social media is one of the most widely used tools in marketing communications, leading to significant brand-related outcomes such as increased brand awareness and enhanced customer engagement (Bento *et al.*, 2018). Social media enables brands to interact directly with their customers, building a sense of community and fostering loyalty through real-time communication. Compared to traditional advertising methods, social media marketing is often more affordable, offering a high return on investment through targeted advertising and organic reach. Consistent and strategic use of social media helps increase brand awareness and recognition, making it easier for customers to remember and choose the brand. Social media provides extended options for clients to become aware of and motivated towards buying decisions on brands through posts, tweets, and pins on platforms like Facebook, Twitter, Instagram, and Pinterest. The proliferation of social media has changed the way luxury brands interact with their customers, posing new challenges as well as opportunities to luxury brands (Kim and Ko, 2012). Social media refers to the means of communication among people in which they create, share, and exchange information and ideas in virtual communities and networks (Ahlqvist *et al.*, 2010). Social media helps companies strengthen brand experience and communicate brand value and brand attribute. Unlike traditional marketing that

* Ms. Poudel is a Freelance Researcher, Kathmandu, Nepal.

heavily relies on television advertisements, newspapers, magazines, billboards, radio, and brochures, social media marketing is more flexible and has more benefits to the business (Edosomwan *et al.*, 2011).

Social media marketing has given organizations a new way of dealing and changing the buying behavior of the consumers. People use social media to share their experiences, reviews, information, advice, warnings, tips and any kind of issues that are interesting to their connection or friends. Social media is used as advertising for the marketer. Marketers take this advantage and create marketing strategy, which in turn could help them gain more customers. Consumers are increasingly using social media sites to search for information and turning away from traditional media, such as television, radio, and magazines (Mangold and Faulds, 2009). The advent of social media has transformed traditional one-way communication into multi-dimensional, two-way, peer-to-peer communication (Berthon *et al.*, 2008). Social media affects advertising attitudes, brand attitudes, and purchasing intentions of consumer. The internet and social media have completely transformed the ways companies communicate with consumers, to the extent that they have become key drivers of new marketing and public relations rules (Scott, 2009). Social media has become a popular communication tool, allowing customers to connect and interact with businesses. It has shifted from core dyadic interactions between consumers and marketers to interactions involving a variety of stakeholders, including customers, organizations, influencers, and non-customers (Bryła *et al.*, 2022). Social media has become an integral part of modern society, and its impact on consumer behavior has been widely studied. Social media also provides an opportunity for consumers to compare price, quality, features, services, and usability of products and services offered by different companies of the same kind (Rafiq and Javeid, 2014). Online advertising and marketing have been the integral sector in the contemporary era. New media has a large potential to emerge a new segment of customers. Customers use the internet not solely to buy the product online but additionally to examine prices, product features, and after sale carrier amenities they will receive if they buy the product from a specific shop (Kochar and Kaur, 2018). Customer satisfaction is one of the primary factors leading to customer loyalty and continuation of relationships. The technology boom of recent years has led more and more businesses to resort to social media as an interactive platform enabling effective marketing. Initially, social media was simply perceived as an opportunity to remain connected with friends and family. Social media enables interactive communication with a wide range of people to transmit messages, feelings, and emotions (Hossain and Sakib, 2016).

The emergence of the social media network has had a tremendous impact on business strategies and brings a drastic change in marketing strategies (Manzoor *et al.*, 2020). Before people make purchases nowadays, they are increasingly reaching out first to their social media communities for opinions. In the fields of marketing, advertisement and communication, social media is much more relevant, with the number of users increasing dramatically every year (Appel *et al.*, 2020). Customers who have a close relationship with a firm share their interactions on social media with other people and suggest the goods or services of the company to their friends through positive word of mouth. Social media technology has created radically new ways of connecting retailers and consumers (Iacobucci and Hoeffler, 2016). Customer engagement in the field of relationship marketing, not only incorporates the relations established between buyers and sellers but also any possible combination between potential and actual clients and all other stakeholders. With the advancement of the internet, electronic word-of-mouth (e-WOM) has spread much faster than its more conventional offline WOM predecessor (Cheung *et al.*, 2008).

Ramesh and Vidhya (2019) assessed the effect of digital marketing on online consumer buying behavior at Vellore city. The study found that there is a significant effect of consumer perception on digital marketing, and effectiveness of digital marketing on online consumer buying behavior. The study also found that content marketing is the highly preferred digital marketing channel, which induces the consumer to take online buying decisions. Fast moving marketing trends based on the

growth and innovation of new technologies as well as portable communication devices influence the customer behavior significantly. A well-designed marketing plan with specific digital marketing tools is the demand in the integrated marketing communication plan for this tech friendly environment. High speed internet connectivity brings massive number of young crowds in social media indicating marketer should be more focused and concentrated in digital marketing tools for effective and efficient targeting of market as well as to achieve other organizational goals (Yamin, 2017). Social media marketing is a new tendency and a fast-growing method to reach targeted consumers effortlessly and efficiently. Additionally, social media marketing can be modestly defined as using social media channels to encourage a business and its products (Bansal et al., 2014). Content marketing is a strategy involving creating and publishing content on websites and social media. Content includes videos, blogs, white paper PDF, website articles. All these are considered as online content marketing. Mostly, the consumer can search for information through online devices regarding their purchasing. It is easy to capture the market by providing vast amounts of information to the customers. The key to content marketing is to deliver valuable content to customers (Knoblich *et al.*, 2017). Most customers have more awareness than traditional customers when they are buying by comparing with the competitors' production to increase their satisfaction level with high value.

In the context of Nepal, Paudel and Dahal (2022) determined the impact of digital marketing on consumer behavior in Kathmandu Valley. The study showed that digital advertising, social media marketing, mobile marketing, email marketing and product/service review have a positive impact on consumer behavior in Kathmandu Valley. The study concluded that better digital marketing leads to higher level of impact on consumer behavior. The study also concluded that product/service review is the most influencing factor that explains the change in consumer behavior in the context of Kathmandu Valley. Kunwar (2022) examined the impact of social media marketing on consumer buying behaviour of apparels in Kathmandu Valley. The study showed that electronic word of mouth, blogs, social networking sites, micro blogging, social news site and media sharing system have positive impact on consumer buying behaviour of apparels in Kathmandu Valley. The study concluded that social media marketing plays vital role in stimulating the buying behavior of the consumers. The study also concluded that media sharing system followed by social news sites and microblogging is the most influencing factor that explains the consumer buying behavior of apparels in Kathmandu Valley. Nowadays social media has been playing a dominant role in marketing communication process. Social media has been a part of life for every people who have access to the internet. Social media provide a new landscape for brand marketing communication, where consumers take a more active role as marketers, and brands are social currency (Vaidya, 2020).

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of social media marketing on customer engagement. 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 media marketing on customer engagement in Kathmandu Valley. Specifically, it examines the relationship of customization, trust, product quality, customer awareness, content marketing, and attractiveness with consumer engagement 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 168 respondents through questionnaire. The study is based on convenience sampling method. The respondents' views were collected on customization, trust, product quality, customer awareness, content marketing, attractiveness with engagement in social media. The study is based on descriptive and causal comparative research design.

The model

The model used in this study assumes that customer engagement depends upon customization, trust, customer awareness, product quality, attractiveness and content marketing. Therefore, the model takes the following form:

$$CE = \beta_0 + \beta_1 C + \beta_2 T + \beta_3 CA + \beta_4 PQ + \beta_5 A + \beta_6 CM + e$$

Where,

C = Customization

T = Trust

CA = Customer awareness

PQ = Product quality

A = Attractiveness

CM = Content marketing

CE = Customer engagement

Customization 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 social media marketing allows me to personalize my shopping experience according to my preferences and needs", "I believe that businesses in Kathmandu Valley effectively utilize social media platforms to offer customized products or services" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.883$).

Trust 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 trust the information about products and services that businesses in Kathmandu Valley share on social media", "I find the product descriptions provided by businesses in Kathmandu Valley on social media to be reliable" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.916$).

Consumer awareness 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 discover new products or services through social media marketing", "The information provided in social media advertisements is helpful in my decision-making process" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.865$).

Product quality 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 believe the quality of products promoted on social media by businesses in Kathmandu Valley meets my expectations", "I find that social media advertisements accurately represent the quality of products available in Kathmandu Valley" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.902$).

Attractiveness 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 find the visuals and design of social media advertisements from businesses in Kathmandu Valley appealing”, “The attractive presentation of products on social media influences my decision to engage with businesses in Kathmandu Valley” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.900$).

Content marketing 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 find the content shared by businesses on social media to be informative and helpful”, “The content I see on social media from businesses in Kathmandu Valley influences my purchasing decisions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.879$).

Customer engagement 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 7 items and sample items include “I frequently like, share, or comment on social media posts from businesses based in Kathmandu Valley”, “I feel more connected to brands in Kathmandu Valley that actively engage with customers on social media” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.929$).

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

Customization

Customization in social media marketing creates a more personalized and relevant experience for users, which significantly enhances customer engagement. By leveraging data and insights to tailor content and interactions, brands can build stronger connections with their audience and drive higher levels of engagement. According to Fels *et al.* (2017), customization has a positive relationship with customer satisfaction, emotional attachment, product longevity, and repurchase rates. This demonstrates that allowing customers to personalize their products at various stages significantly benefits both the customer and the company, enhancing customer loyalty and improving product lifecycle outcomes. Moreover, Pansari and Kumar (2017) revealed that customization has a positive impact on enhancing customer engagement by creating a more personal and relevant experience. This leads to higher satisfaction, stronger emotional attachment, and increased direct and indirect contributions to the firm. According to Ansari and Mela (2003), well-executed customized communications and targeted content approaches have a positive impact on customer engagement. The increased relevance and reduction in information overload are key factors contributing to this positive relationship. Godey *et al.* (2016) stated that customization in social media marketing positively influences customer engagement by creating personalized, relevant, and interactive experiences that foster loyalty and deeper connections with the brand. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between customization and customer engagement.

Trust

Kharel (2018) investigated the impact of factors influencing online brand trust in Kathmandu Valley. The study found that trust is regarded as an important factor and has positive relationships with the consumers to purchase online. When a brand is perceived as trustworthy, customers are more likely to believe in the authenticity and credibility of the content shared on social media. This credibility encourages more interactions, such as likes, comments, shares, and recommendations. According to Meskaran *et al.* (2013), customer trust is the most fundamental factor for an online store. Trust in online

sites is a positive significant determinant in deciding the achievement or failure of any e-commerce activities in the market. Trustworthy brands generate positive word-of-mouth. Customers who trust a brand are more likely to share their positive experiences with others on social media, leading to increased engagement from both the original audience and new potential customers. Tuti and Sulistia (2022) showed a positive relationship between customer engagement and customer satisfaction, brand loyalty, and brand trust. Li and Wang (2020) revealed that engaged customers are more likely to develop trust in the brand, which in turn enhances brand loyalty so the study underscores that trust has a positive relationship with customer engagement. Based on it, the study develops the following hypothesis:

H₂: There is a positive relationship between trust and customer engagement.

Product quality

It is very important to manage quality in business to ensure the best quality service for consumers. Better quality can drive consumer satisfaction. Foster (2016) examined the impact of price and product quality on consumer satisfaction. The study concluded that product quality has a positive impact on customer satisfaction. High-quality product presentations on social media, such as detailed images, videos, and testimonials, enhance the perceived quality of the product. This positive perception encourages customers to engage with the content, showing interest through likes, shares, and comments. Vasic *et al.* (2019) explored the influence of online shopping determinants on customer satisfaction in the Serbian market. The study found that product quality has a positive impact on consumer engagement. Lee *et al.* (2020) found that perceived quality has a significant positive impact on consumers' attitudes and behaviors towards luxury goods. Effectively communicating product quality via social media can significantly enhance customer engagement, as it builds trust, attracts attention, and fosters a community of satisfied and loyal customers. Based on it, the study develops the following hypothesis:

H₃: There is a positive relationship between product quality and customer engagement.

Customer awareness

Customer awareness is the extent to which customers are informed about a product, service, brand, or company. It encompasses customers' recognition, understanding, and knowledge of these elements, influencing their perceptions and purchase decisions. Pansari and Kumar (2017) emphasized that customer engagement is crucial and has a positive impact on building strong, long-term relationships and maintaining effective strategies to enhance customer awareness to maximize overall firm performance. Jaitly and Gautam (2021) highlighted a positive and significant role of social media influencers in enhancing customer engagement and brand awareness. Loureiro and Lopes (2019) revealed that co-creating socially responsible activities in social media significantly enhances customer engagement and customer awareness. Gallart-Camahort *et al.* (2021) concluded that customer awareness has a significant positive impact on customer engagement. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between customer awareness and customer engagement.

Attractiveness

Attractive visuals can convey a sense of quality and professionalism, which can enhance the perceived value of the product or service being promoted. This can lead to increased trust and engagement from potential customers. Ahsan *et al.* (2024) found that social media plays a pivotal role in creating attractiveness, awareness and fostering customer engagement. Bazi *et al.* (2023) concluded that attractiveness in social media content is positively influenced by its aesthetic quality and celebrity endorsements that drives customer engagement with luxury fashion brands. Beautiful and aesthetically

pleasing content can evoke positive emotions, making viewers more likely to engage with the content. People often share content that makes them feel good or aligns with their personal tastes and values. Eslami *et al.* (2024) suggested that the attractiveness of a social media post, as determined by its popularity, discourse logic, and argument frame, positively influences customer engagement. Social media influencers, who are often perceived as attractive, tend to have higher engagement rates. Their followers are drawn to their content not only because of their appearance but also because of the aspirational lifestyle they often portray. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between attractiveness and customer engagement.

Content marketing

Content marketing plays a crucial role in creating meaningful interactions between a brand and its audience, leading to increased customer engagement and long-term business success. Prasetya and Susilo (2022) indicated a positive relationship between content marketing and customer engagement. High-quality content provides valuable information, insights, and entertainment to the audience. When customers find content helpful and relevant, they are more likely to engage with it, sharing it with others and returning for more. Weerasinghe (2019) revealed a statistically significant positive correlation between content marketing efforts and customer online engagement, indicating that as content marketing initiatives increase, so does customer engagement with the brand online. Ho *et al.* (2020) showed a positive relationship between content marketing strategies and customer engagement on Instagram for fashion brands in Vietnam. Consistent, informative, and authentic content helps build trust with the audience. Customers are more likely to engage with and support brands they trust. Content that addresses customer pain points and offers solutions fosters this trust. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between content marketing and customer engagement.

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 168 observations. The dependent variable is CE (Consumer engagement). The independent variables are C (Customization), T (Trust), PQ (Product quality), CA (Customer awareness), A (Attractiveness) and CM (Content marketing).

Variables	Mean	SD	CE	C	T	CA	PQ	A	CM
CE	3.589	0.952	1						
C	3.613	0.864	0.551**	1					
T	3.171	1.008	0.525**	0.510**	1				
CA	3.733	0.817	0.545**	0.592**	0.446**	1			
PQ	3.236	0.970	0.583**	0.564**	0.650**	0.532**	1		
A	3.637	0.873	0.594**	0.574**	0.511**	0.608**	0.584**	1	
CM	3.654	0.814	0.623**	0.547**	0.474**	0.587**	0.538**	0.562**	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 for dependent and independent variables. The result shows that customization is positively correlated to customer engagement, indicating that more customized products or services lead to higher customer engagement. Similarly, trust also shows a positive correlation with consumer engagement implying that higher level of trust in the brand or product enhances customer engagement. Additionally, customer awareness is positively correlated to customer engagement. It implies that increased awareness of the product or brand boosts customer engagement. In addition, the study shows that product quality is positively correlated to customer engagement. This means that the better product quality results in higher customer engagement. In addition, consumer awareness is positively correlated to customer engagement. It indicates that increasing awareness through advertising and social media leads to increase in customer engagement. Furthermore, content marketing is positively correlated to customer engagement. It shows that better content marketing leads to increase in customer engagement.

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 customization, trust, customer awareness, product quality, attractiveness, and content marketing on customer engagement in Kathmandu Valley.

Table 2

Estimated regression results of customization, trust product quality, customer awareness, attractiveness and content marketing on customer engagement in Kathmandu Valley

The results are based on 168 observations using linear regression model. The model is $CE = \beta_0 + \beta_1 C + \beta_2 T + \beta_3 CA + \beta_4 PQ + \beta_5 A + \beta_6 CM + e$, where the dependent variable CE (Consumer engagement). The independent variables are C (Customization), T (Trust), PQ (Product quality), CA (Customer awareness), A (Attractiveness) and CM (Content marketing).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		C	T	CA	PQ	A	CM			
1	0.761 (3.397)**	0.783 (12.984)**						0.501	0.673	168.574
2	1.609 (8.784)**		0.624 (11.344)**					0.433	0.717	128.697
3	0.372 (1.597)			0.862 (14.117)**				0.543	0.644	199.289
4	1.314 (7.307)**				0.703 (13.198)**			0.509	0.667	174.180
5	0.529 (2.624)**					0.842 (15.622)**		0.593	0.608	244.044
6	0.084 (0.433)						0.959 (18.433)**	0.670	0.547	339.782
7	0.635 (3.011)**	0.535 (7.140)**	0.322 (5.023)**					0.564	0.628	109.209
8	0.119 (0.553)	0.227 (2.578)**	0.265 (4.426)**	0.484 (5.584)**				0.632	0.578	96.517
9	0.155 (0.730)	0.189 (2.139)**	0.159 (2.148)*	0.424 (4.763)**	0.205 (2.399)*			0.642	0.570	75.924
10	0.079 (0.387)	0.125 (1.449)	0.121 (1.690)	0.235 (2.364)*	0.159 (1.919)*	0.352 (3.787)**		0.669	0.548	68.581
11	0.207 (1.094)	0.047 (0.594)	0.101 (1.565)	0.057 (0.608)	0.097 (1.288)	0.232 (2.715)**	0.530 (6.312)**	0.733	0.492	77.494

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 engagement is the dependent variable.

The regression results shows that the beta coefficients for customization are positive with consumer engagement. It indicates that customization has a positive impact on consumer engagement.

This finding is consistent with the findings of Fels *et al.* (2017). Likewise, the beta coefficients for trust are positive with consumer engagement. It indicates that trust has a positive impact on consumer engagement. This finding is similar to the findings of Kharel (2018). Similarly, the beta coefficients for product quality are positive with consumer engagement. It indicates that product quality has a positive impact on consumer engagement. This finding is consistent with the findings of Foster (2016). Likewise, the beta coefficients for customer awareness are positive with consumer engagement. It indicates that customer awareness has a positive impact on consumer engagement. This finding is similar to the findings of Jaitly and Gautam (2021). Similarly, the beta coefficients for attractiveness are positive with consumer engagement. It indicates that attractiveness has a positive impact on consumer engagement. This finding is consistent with the findings of Eslami *et al.* (2024). Likewise, the beta coefficients for content marketing are positive with consumer engagement. It indicates that content marketing has a positive impact on consumer engagement. This finding is similar to the findings of Ho *et al.* (2020).

4. Summary and conclusion

The world is witnessing major developments in communications due to the intensive spread of technology and information through the internet using different mediums such as the smartphone, social media platforms, and the electronic word-of-mouth. These technological advancements make the world look like a small village as these communication media are able to facilitate access and interaction with consumers. Consumers use digital communication channels to search for product information and services. It has become part of people's everyday life. Today, digital marketing has become a phenomenon that brings together customization and mass distribution to accomplish marketing goals. Digital marketing is a product or services that using digital channels to reach consumers. Their objective is to promote the brands through various medium form of digital media. Social media are a great opportunity to establish significant relationships and create ways of social interaction defined through dynamic exchanges between their members. Social media is booming in terms of the number and variety of platforms and users.

This study attempts to examine the impact of social media marketing on customer engagement in Kathmandu Valley. The study is based on primary data with 168 observations.

The major conclusion of the study is the study showed that customization, trust, product quality, awareness, content marketing, and attractiveness have positive impact on customer engagement. These factors create a comprehensive strategy that not only attracts but also retains and engages customers, resulting in a robust and active social media presence. By leveraging these elements effectively, brands can build strong, lasting relationships with their audience, leading to sustained success in their social media marketing efforts. The study also concluded that content marketing is the most influencing factor that explains the changes in the customer engagement in the context of Kathmandu Valley.

References

- Ahlqvist, T., A. Bäck, S. Heinonen, and M. Halonen, 2010. Road-mapping the societal transformation potential of social media. *Foresight* 12(5), 3-26.
- Ahsan, N., S. Jamil, and M. Rais, 2024. The influence of social media influencers on consumer decision-making: A comprehensive SEM analysis. *International Journal of Social Science and Entrepreneurship* 4(2), 317-341.
- Ansari, A., and C. F. Mela, 2003. E-customization. *Journal of Marketing Research* 40(2), 131-145.
- Appel, G., L. Grewal, R. Hadi, and A. T. Stephen, 2020. The future of social media in marketing. *Journal of the Academy of Marketing Science* 48(1), 79-95.
- Bazi, S., R. Filieri, and M. Gorton, 2023. Social media content aesthetic quality and customer engagement:

- The mediating role of entertainment and impacts on brand love and loyalty. *Journal of Business Research* 16(1), 113-117.
- Bansal, R., R. Masood, and V. Dadhich, 2014. Social media marketing- A tool of innovative marketing. *Journal of Organizational Management* 3(1), 1-7.
- Berthon, P., L. Pitt, and C. Campbell, 2008. Ad lib: When customers create the ad. *California Management Review* 50(4), 6-30.
- Bento, M., L. M. Martinez, and L. F. Martinez, 2018. Brand engagement and search for brands on social media: Comparing Generations X and Y in Portugal, *Journal of Retailing and Consumer Services* 43(1), 234-241.
- Bryła, P., S. Chatterjee, and B. Ciabiada-Bryła, 2022. The impact of social media marketing on consumer engagement in sustainable consumption: A systematic literature review. *International Journal of Environmental Research and Public Health* 19(24), 1-16.
- Cheung, C. M., M. K. Lee, and N. Rabjohn, 2008. The impact of electronic word-of-mouth: The adoption of online opinions in online customer communities. *Internet Research* 18(3), 229-247.
- Edosomwan, S., K. S. Prakashan, D. Kouame, J. Watson, and T. Seymour, 2011. The History of social media and its Impact on Business. *Journal of Applied Management and Entrepreneurship* 16(3), 79-91.
- Eslami, P., M. Najafabadi, and A. Gharehgozli, 2024. Exploring the journey of influencers in shaping social media engagement success. *Online Social Networks and Media* 41(1), 2-11.
- Fels, A., B. Falk, and R. Schmitt, 2017. User-driven customization and customer loyalty: A survey. *Procedia CIRP* 60(1), 410-415.
- Foster, B., 2016. Impact of brand image on purchasing decision on mineral water product "Amidis" (Case study on bintang trading company). *American Research Journal of Humanities and Social Sciences* 2(1), 1-11.
- Gallart-Camahort, V., L. Callarisa-Fiol, and J. Sanchez-Garcia, 2021. The impact of customer engagement on retailer's brand equity components. *Marketing management innovation* 8(3), 127-138.
- Godey, B., A. Manthiou, D. Pederzoli, J. Rokka, G. Aiello, R. Donvito, and R. Singh, 2016. Social media marketing efforts of luxury brands: Influence on brand equity and consumer behavior. *Journal of Business Research* 69(12), 5833-5841.
- Ho, T. V., T. N. Phan, and V. P. Le-Hoang, 2020. The authenticity of celebrity endorsement on purchase intention- case on local fashion brand in Vietnam. *International Journal of Management* 11(6), 1347-1356.
- Hossain, S., and Sakib, M. N. 2016. The impact of social media marketing on university students' brand loyalty. *International Journal of Marketing and Business Communication* 5(3), 1-7.
- Hsu, Y. L., 2012. Facebook as international eMarketing strategy of Taiwan Hotels, *International Journal of Hospitality Management* 31(3), 9-47.
- Iacobucci, D., and S. Hoeffler, 2016. Leveraging social networks to develop radically new products. *Journal of Product Innovation Management* 33(2), 217-223.
- Jaitly, R. C., and O. Gautam, 2021. Impact of social media influences customer engagement and brand perception. *International Journal of Internet Marketing and Advertising* 15(2), 220-242.
- Kharel, B., 2018. Factors influencing online brand trust: evidence from online buyers in Kathmandu Valley. *Journal of Business and Social Sciences Research* 3(1), 47-64.
- Kim, A. J., and E. Ko, 2012. Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand. *Journal of Business Research* 65(10), 1480-1486.
- Knoblich, S., A. Martin, R. Nash, and P. Stansbie, 2017. Keys to success in Social Media Marketing (SMM)– Prospects for the German airline industry. *Tourism and Hospitality Research* 17(2), 147-164.
- Kochar, R., and H. Kaur, 2018. A review of factors affecting consumer behavior towards online shopping. *International Journal of Engineering and Management Research* 8(4), 54-58.

- Kunwar, B., 2022. Impact of social media marketing on consumer buying behaviour of apparels in Kathmandu Valley. *Management in New Millennium: A Perspective from an Emerging Economy of Nepal* 1(1), 395-408.
- Lee, M., J. Bae, and D. M. Koo, 2021. The effect of materialism on conspicuous vs inconspicuous luxury consumption: focused on need for uniqueness, self-monitoring and self-construal. *Asia Pacific Journal of Marketing and Logistics* 33(3), 869-887.
- Li, L., and W. Wang, 2020. The effects of online trust-building mechanisms on trust in the sharing economy: the perspective of providers. *Sustainability* 12(5), 1717.
- Loureiro, S. M. C., and J. Lopes, 2019. How corporate social responsibility initiatives in social media affect awareness and customer engagement. *Journal of Promotion Management* 25(3), 419-438.
- Mangold, W. G., and D. J. Faulds, 2009. Social media: The new hybrid element of the promotion mix. *Business Horizons* 52(4), 357-365.
- Manzoor, U., S. A. Baig, M. Hashim, and A. Sami, 2020. Impact of social media marketing on consumer's purchase intentions: the mediating role of customer trust. *International Journal of Entrepreneurial Research* 3(2), 41-48.
- Meskanan, F., Z. Ismail, and B. Shanmugam, 2013. Online purchase intention: Effects of trust and security perception. *Australian Journal of Basic and Applied Sciences* 7(6), 307-315.
- Paudel, N., and M. H. Dahal, 2022. Impact of digital marketing on consumer behavior in Kathmandu Valley. *Management in New Millennium: A Perspective from an Emerging Economy of Nepal* 1(1), 357-368.
- Pansari, A., and V. Kumar, 2017. Customer engagement: the construct, antecedents, and consequences. *Journal of the Academy of Marketing Science* 45(1), 294-311.
- Prasetya, M., and D. Susilo, 2022. The effect of content marketing on purchase intention through customer engagement as variable mediation. *Jurnal Komunikasi Profesional* 6(5), 423-434.
- Rafiq, Y., and U. Javeid, 2014. Impact of social media on consumer buying behavior. *International Journal of Business and Social Science* 5(10), 27-33.
- Ramesh, M., and B. Vidhya, 2019. Digital marketing and its effect on online consumer buying behavior. *Journal of Services Research* 19(2), 61-77.
- Scott, D. M., 2009. *The New Rules of Marketing and PR* (John Wiley and Sons, London).
- Tuti, M., and V. Sulistia, 2022. The customer engagement effect on customer satisfaction and brand trust and its impact on brand loyalty. *Journal of Business Management* 13(1), 1-15.
- Vaidya, R., 2020. Effectiveness of Facebook as a marketing tool: A study among the users in Kathmandu Valley. *Management*, 8(4), 14-20.
- Vasic, N., M. Kilibarda, and T. Kaurin, 2019. The influence of online shopping determinants on customer satisfaction in the Serbian market. *Journal of Theoretical and Applied Electronic Commerce Research* 14(2), 70-89.
- Weerasinghe, K. P. W. D. R., 2019. Impact of content marketing towards the customer online engagement. *International Journal of Business, Economics and Management* 2(3), 217-2018.
- Yamin, A. B., 2017. Impact of digital marketing as a tool of marketing communication: a behavioral perspective on consumers of Bangladesh. *American Journal of Trade and Policy* 4(3), 117-122.

Chapter 27

Relationship between Job Satisfaction and Turnover Intention in Nepalese Service Sector

Shovita Adhikari*

Abstract

The study examines the relationship between job satisfaction and turnover intention in Nepalese service sector. Job satisfaction and turnover intention are the dependent variables. The independent variables are job stress, supervisor relationship, compensation, career development and work life balance. The study is based on primary data with 132 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 on job satisfaction and turnover intention in Nepalese service sector.

The results showed that job stress has a positive effect on turnover intention. It indicates that increase in job stress leads to increase in turnover intention. Similarly, supervisor relationship has a negative effect on turnover intention. It indicates that better supervisor relationship leads to decrease in turnover intention. However, compensation has a negative effect on turnover intention. It indicates that increase in compensation leads to decrease in turnover intention. Further, career development has a negative effect on turnover intention. It indicates that increase in career development opportunities leads to decrease in employee turnover intention. In addition, work life balance has a negative effect on turnover intention. It indicates that better the work life balance, lower would be the level of turnover intention. The study showed that job stress has a negative effect on job satisfaction. It indicates that increase in job stress leads to decrease in job satisfaction. Similarly, supervisor relationship has a positive effect on job satisfaction. It indicates that better supervisor relationship leads to increase in job satisfaction. However, compensation has a positive effect on job satisfaction. It indicates that increase in compensation leads to increase in job satisfaction. Further, career development has a positive effect on job satisfaction. It indicates that increase in career development opportunities leads to increase in employee job satisfaction. In addition, work life balance has a positive effect on job satisfaction. It indicates that better the work life balance, higher would be the level of job satisfaction.

Keywords: turnover intention, satisfaction, job stress, supervisor relationship, compensation, career development, work life balance

1. Introduction

Employee turnover is an important issue that poses a significant challenge for organizations. Since human capital is central to an organization's performance, workforce attrition can have a profound impact on an organization's performance, growth and general business outcomes (Akinyomi, 2016). According to Iqbal (2010), poor job retention among employees lead to many costs associated with employee turnover which include additional burden on remaining staff, recruitment and training costs, lost productivity, loss of clients and loss of intellectual capital. Employee turnover can significantly hinder the productivity and performance levels of an organization, creating a ripple effect that extends throughout various aspects of the workplace. When employees leave, especially those who possess critical skills and knowledge, the organization loses valuable experience and expertise that are not easily replaced. This loss can disrupt ongoing projects, delay timelines, and increase the workload on the remaining staff, who may already be stretched thin. The time and resources required to recruit, hire,

* Ms. Adhikari is a Freelance Researcher, Kathmandu, Nepal.

and train new employees further compound the problem, diverting attention and funds away from core business activities.

Al Mamun and Hasan (2017) stated that employee turnover represents the movement of employees out of an organization, either through voluntary resignation, termination, or retirement. High turnover rates can also negatively impact employee morale, as constant changes in the workforce can lead to uncertainty and instability within teams. This environment can foster stress and burnout among remaining employees, who may feel overburdened by the additional responsibilities and pressure to maintain productivity levels. Furthermore, the sense of camaraderie and teamwork can suffer, weakening the overall organizational culture and diminishing job satisfaction. As job satisfaction decreases, it can create a vicious cycle, prompting even more employees to leave, thus perpetuating the turnover problem. In this way, high employee turnover not only directly affects the organization's operational efficiency but also undermines the overall work environment, leading to a decline in both individual and collective performance levels.

Employee turnover is the process by which employees leave an organization, resulting in the need for replacement and potentially affecting organizational productivity and morale. Employee turnover represents the departure of employees from an organization, whether voluntary or involuntary, and can have consequences for organizational performance and effectiveness (Pietersen and Oni, 2014). Samuel and Chipunza (2009) defined employee turnover as the movement of employees out of an organization's workforce either through resignation, dismissal, or retirement. Employee turnover represents the proportion of employees who leave an organization over a given period, often expressed as a percentage of the total workforce. Poor job feedback, job dissatisfaction, unmet job expectations, performance problems, situational constraints, socialization difficulties, greater degrees of job stress, and a lack of career advancement opportunities are the major causes of employee turnover (Arnold, 2015). Poor job feedback, which entails inadequate or negative communication from supervisors, can leave employees feeling undervalued and unsupported, diminishing their motivation and engagement. Job dissatisfaction, stemming from various sources such as unfavorable working conditions, inadequate compensation, and lack of recognition, can drive employees to seek better opportunities elsewhere. When job expectations set during the hiring process are not met, employees may feel deceived and disillusioned, prompting them to leave in search of roles that align more closely with their aspirations.

Samasonok (2024) found that failure in job expectations, the lack of motivation and the professional skills required were the main personal factors impacting employees' willingness to change jobs. On the other hand, uncompetitive salaries and limited opportunities for career and professional development, as well as underestimation of work results and efforts, ignoring the individual needs of employees, restricted possibilities to show initiative and participate in decision-making processes and lack of room for self-expression and realization of one's personality are considered the most critical external reasons determining employee turnover in the organization. Gichungu *et al.* (2024) revealed a negative significant relationship between work environments on employee turnover in the insurance industry in Kenya. The study also revealed that overload of demand with minimal response mechanisms often leads to high levels of stress among the employees of the institution, often leading to employees leaving the institution or low job performances. Mobley (1977) concluded that high job satisfaction is associated with lower turnover rates. Dissatisfied employees are more likely to leave their jobs. Performance problems, whether due to a mismatch between an employee's skills and job requirements or insufficient training, can lead to frustration and decreased job satisfaction. Situational constraints, such as a lack of necessary resources, restrictive policies, or unsupportive management, can hinder employees' ability to perform their duties effectively, contributing to their decision to leave. Socialization difficulties, including challenges in forming connections with colleagues or integrating

into the organizational culture, can lead to feelings of isolation and dissatisfaction. Meyer and Allen (1991) revealed that employees with a high level of organizational commitment are less likely to leave the organization. Greater degrees of job stress, often resulting from excessive workloads, tight deadlines, or high-pressure environments, can negatively impact employees' mental and physical well-being, pushing them toward resignation. Moreover, a lack of career advancement opportunities can stifle employees' professional growth and ambition, leading them to pursue careers in organizations that offer clearer pathways for progression. Addressing these issues is crucial for organizations to reduce turnover rates and retain talented employees, thereby enhancing overall productivity and stability.

Saks (2006) showed that engaged employees are less likely to leave their jobs. Fostering an environment that promotes engagement can reduce turnover. Blau (1987) revealed that Employees who feel they are progressing in their careers are less likely to seek opportunities elsewhere. Eisenberger (1986) concluded that employees who perceive higher organizational support are less likely to leave the organization. Schneider (2013) found that a positive work environment, characterized by a supportive culture, positively affects employee retention. Inflexible work hour, work overload, risky job and poor coworker relations are the main contributor to job stress which create dissatisfaction among the employees. The several factors like job timing, pay, bonus, workload, and peer attitude which cause stress in employees at job (Manzoor, 2011). Workload, technological problem, higher target, competition and salary, outcome of decision, management and peer support behavior, longer time frame are the main factors of causing stress in employees (Badar, 2011). With increase in designation, stress increase and factor of creating stress in employees are feeling undervalued, work home interface, fear of joblessness, traumatic incident at work and economic instability.

In the context of Nepal, turnover is considered as one of the main issues in Nepalese organizations (Chalise, 2019). Adhikari (2020) examined employees' turnover intention in Nepalese commercial bank. The study revealed that that employees' turnover intention of Nepalese commercial banks is positively and significantly correlated with compensation, leadership empowerment behavior, organization culture and job stress. Chaudhary (2022) analyzed the reasons of employee turnover in the banking sector of Nepal. The finding of the study emphasized that employee tends to leave the current job due to the lack of proper environment and facilities provided by the banks. The study concluded that manager in sample banks to some extent lack awareness regarding to which job embeddedness predict employee turnover intentions. As the global economy is progressively knowledge driven, and with a global skills shortage, intellectual capital has become a source of competitive advantage for organizations. Likewise, in this 21st century, the success of an organization depends on dynamic and diverse environmental influences. One of the issues is managing outflow of employees from the organizations, as proliferation of turnover will lead the organizations towards weak competition. Considering the banking sector as an industry heavily relied on human resources, it is always a priority issue. Similarly, employee job engagement is also one of the factors which create an impact on the organization. It has a vital adobe in understanding employees' job engagement and more vital while understanding, predicting and managing the turnover intentions. That's lead finally towards understanding actual turnover. Biswakarma (2015) focused on the employees' job engagement and its relationship, impact and demographic mediation towards employees' turnover intentions in Nepalese private banking industry context. The study concluded showcasing the negative effects of employees' job engagement on the turnover behavioral decision of an employees in banking industry in Nepal.

The above discussion shows that empirical evidences vary greatly across the studies on the relationship between job satisfaction and turnover intention in service 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 determine the relationship between job satisfaction and turnover intention in Nepalese service sector. More specifically, it examines the relationship of job stress, supervisor relationship, compensation, career development and work life balance with employee job satisfaction and turnover intention in Nepalese service sector.

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 132 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on job stress, supervisor relationship, compensation, career development, work life balance, turnover intention and level of satisfaction in Nepalese service sector. The study is based on descriptive and causal comparative research designs.

The model

The model used in this study assumes that turnover intention and level of satisfaction in Nepalese service sector depends on job stress, supervisor relationship, compensation, career development and work life balance. Therefore, the models take the following forms:

$$JOS = \beta_0 + \beta_1 JS + \beta_2 SR + \beta_3 CMP + \beta_4 CD + \beta_5 WLB + \varepsilon$$

$$TI = \beta_0 + \beta_1 JS + \beta_2 SR + \beta_3 CMP + \beta_4 CD + \beta_5 WLB + \varepsilon$$

Where,

JOS = Job satisfaction

TI= Turnover intention

JS = Job stress

SR = Supervisor relationship

CMP = Compensation

CD = Career development

WLB = Work life balance

Job 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 are 5 items and sample items include "I feel satisfied with the opportunities for growth and advancement in my current role", "I am satisfied with the level of recognition and appreciation I receive for my work" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.881$).

Turnover intention 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 seek out other job opportunities", "I am seriously considering resigning from my current position" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.848$).

Job stress 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 job often leaves me feeling overwhelmed and stressed”, “Work-related pressures often interfere with my ability to relax outside of work” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.860$).

Supervisor relationship 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 supervisor provides clear guidance and direction when needed”, “I feel comfortable discussing work-related issues with my supervisor” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.846$).

Compensation 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 “Compared to similar positions in the industry, I believe my compensation package is competitive”, “I feel valued and appreciated through the compensation I receive for my work” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.864$).

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 “My organization provides ample opportunities for professional growth and advancement”, “I feel supported by my supervisors and colleagues in pursuing my career goals” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.816$).

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 are 5 items and sample items include “My workplace supports initiatives that promote work-life balance”, “I feel energized and fulfilled both at work and in my personal life” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.856$).

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

Job stress

Milleny and Adiputra (2024) concluded that work stress has a positive and significant influence on turnover intention. Moreover, work stress has a negative and significant influence on employee job satisfaction. Similarly, job satisfaction has a negative and insignificant influence on employee turnover intention. Sakti et al. (2024) revealed that unsupportive leadership style and job stress have a positive and significant effect on turnover intention, while job satisfaction has a negative and significant effect on turnover intention. According to Parker and De Cotiis (1983), job stress can frequently result in organizational and personal significant second-level effects including decreased job performance and voluntary turnover. Kemery et al. (1987) revealed that the occupational stress that workers face has been connected to both employee job satisfaction as well as their intention to leave their jobs. According to Hassan (2014), the most important factor determining the intention to leave a job is occupational stress. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between job stress and turnover intention.

H₂: There is a negative relationship between job stress and job satisfaction.

Supervisor relationship

Kalidass and Bahron (2015) defined supervisor relationship as an encouragement and support provided by supervisor to his/her subordinates which leads to an increase in employee's self-confidence. Employees are more likely to view their jobs and employing organizations in a more favorable light if they are provided with positive support from their supervisor (Lambert et al., 2007). Neubauer (2009) argued that the control work practices which are supervision oriented and supportive have significantly associated with job satisfaction and lower turnover rates of the workers. When employees perceive they are in a supportive relationship with their supervisor the outcomes are higher levels of job satisfaction, job performance, and organizational commitment (Dysvik and Kuvaas, 2013). Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between supervisor relationship and turnover intention.

H₄: There is a positive relationship between supervisor relationship and job satisfaction.

Career development

Winda et al. (2017) showed that compensation and career development have a significant positive effect on job satisfaction. Arifin et al. (2020) revealed that recruitment and career development have positive and significant effect on employee performance and competence. However, recruitment and career development have significant negative effect on employee turnover intention. Similarly, Santoso et al. (2021) found that there is a positive and significant influence of career development variable that includes job training, motivation, job satisfaction, work environment, work discipline, leadership and communication on the employee performance. Likewise, Katharina and Dewi (2020) found that career development has positive and significant effect on job satisfaction and negative effect on turnover intention. Wahyuni (2016) concluded that education and training, career development and job satisfaction have positive and significant impact on the employee performance and retention. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between career development and turnover intention.

H₆: There is a positive relationship between career development and job satisfaction.

Compensation

Pertiwi and Supartha (2021) found that compensation has a positive and significant effect on employee retention and job satisfaction. Baqi and Indradewa (2021) argued that compensation received by employees has a significant effect on job satisfaction and commitment. Ibrar and Khan (2015) found that there is a positive and significant relationship of rewards (extrinsic and intrinsic) and incentive with employee's job performance. Likewise, there is a significant impact of moral incentives, rewards, efficiency of reward system, and promotion on employee performance in Jordanian travel and tourism institution (Alfandi and Alkawsaneh, 2014). Based on it, the study develops the following hypothesis:

H₇: There is a negative relationship between compensation and turnover intention.

H₈: There is a positive relationship between compensation and job satisfaction.

Work-life balance

Haar et al. (2014) found that work life balance is positively related to job and life satisfaction and negatively related to anxiety and depression. Agha (2017) revealed that work interference with personal life and personal life interference with work have a negative relationship with job satisfaction.

Jaharuddin and Zainol (2019) revealed a direct relationship between work-life conflicts, job engagement and turnover intention. Kerdpitak and Jermstittiparsert (2020) showed that work life balance and workplace stress significantly influence the turnover intention of the organization. Based on it, the study develops the following hypothesis:

H₉: There is a negative relationship between work life balance and turnover intention.

H₁₀: There is a positive relationship between work life balance and job satisfaction.

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 132 observations. The dependent variables are TI (Turnover intention) and JOS (job satisfaction). The independent variables are JS (Job stress), SR (Supervisor relationship), CMP (Compensation), CD (Career development) and WLB (Work life balance).

Variables	Mean	SD	TI	JOS	JS	SR	CMP	CD	WLB
TI	3.651	0.889	1.000						
JOS	3.606	0.916	-0.294**	1.000					
JS	3.884	0.911	0.135*	-0.042	1.000				
SR	3.615	0.887	-0.161*	0.282**	0.344**	1.000			
CMP	3.613	0.987	-0.239**	0.242**	0.201**	0.329**	1.000		
CD	3.671	0.860	-0.163**	0.298**	0.291**	0.473**	0.392**	1.000	
WLB	3.550	0.914	-0.351**	0.315**	0.125*	0.244**	0.326**	0.251**	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 job stress is positively correlated to turnover intention. It indicates that increase in job stress leads to increase in turnover intention. Similarly, supervisor relationship has a negative relationship with turnover intention. It indicates that better supervisor relationship leads to decrease in turnover intention. However, compensation has a negative relationship with turnover intention. It indicates that increase in compensation leads to decrease in turnover intention. Further, career development is negatively correlated to turnover intention. It indicates that increase in career development opportunities leads to decrease in employee turnover intention. In addition, work life balance is negatively correlated to turnover intention. It indicates that better the work life balance, lower would be the level of turnover intention.

The study shows that job stress is negatively correlated to job satisfaction. It indicates that increase in job stress leads to decrease in job satisfaction. Similarly, supervisor relationship has a positive relationship with job satisfaction. It indicates that better supervisor relationship leads to increase in job

satisfaction. However, compensation has a positive relationship with job satisfaction. It indicates that increase in compensation leads to increase in job satisfaction. Further, career development is positively correlated to job satisfaction. It indicates that increase in career development opportunities leads to increase in employee job satisfaction. In addition, work life balance is positively correlated to job satisfaction. It indicates that better the work life balance, higher would be the level of job satisfaction.

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 estimated regression results of job stress, supervisor relationship, compensation, career development and work life balance on turnover intention of Nepalese service sector.

Table 2

Estimated regression results of job stress, supervisor relationship, compensation, career development and work life balance on turnover intention of Nepalese service sector

The results are based on 132 observations using linear regression model. The model is $TI = \beta_0 + \beta_1 JS + \beta_2 SR + \beta_3 CMP + \beta_4 CD + \beta_5 WLB + \varepsilon$ where the dependent variable is TI (Turnover intention). The independent variables are JS (Job stress), SR (Supervisor relationship), CMP (Compensation), CD (Career development) and WLB (Work life balance).

Model	Intercept	Regression coefficients of					Adj. R ²	SEE	F-value
		JS	SR	CMP	CD	WLB			
1	2.179 (8.534)	0.164 (1.942)					0.021	0.88	3.771
2	2.153 (9.038)		-0.191 (2.208)				0.029	0.876	4.873
3	1.921 (9.159)			-0.279 (3.718)			0.089	0.848	13.824
4	2.152 (8.603)				-0.187 (2.095)		0.025	0.878	4.388
5	1.583 (7.591)					-0.419 (5.439)	0.179	0.805	29.579
6	1.979 (6.902)	0.102 (1.094)	-0.145 (1.507)				0.031	0.875	3.039
7	1.755 (6.275)		-0.087 (0.836)	-0.248 (2.922)	-0.007 (0.067)		0.082	0.852	4.915
8	1.349 (4.915)			0.135 (1.599)	-0.018 (0.199)	-0.353 (4.164)	0.187	0.801	11.067
9	1.292 (4.489)	0.113 (1.463)				-0.405 (5.238)	0.186	0.802	15.988

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.
- Turnover intention is dependent variable.

The regression results show that the beta coefficients for job stress are positive with turnover intention. It indicates that job stress has a positive impact on turnover intention. This finding is consistent with the findings of Parker and De Cotiis (1983). Similarly, the beta coefficients for supervisor relationship are negative with turnover intention. It indicates that supervisor relationship has a negative impact on turnover intention. This finding is similar the findings of Kalidass and Bahron (2015) Likewise, the beta coefficients for compensation are negative with turnover intention. It indicates that compensation has a negative impact on turnover intention. This finding is consistent with the findings of Baqi and Indradewa (2021). Further, the beta coefficients for career development are negative with turnover intention. It indicates that career development has a negative impact on turnover intention. This finding is similar to the findings of Wahyuni (2016). In addition, the beta coefficients for work life

balance are negative with turnover intention. It indicates that work life balance has a negative impact on turnover intention. This finding is consistent with the findings of Jaharuddin and Zainol (2019).

Table 3 shows the estimated regression results of job stress, supervisor relationship, compensation, career development and work life balance on job satisfaction of Nepalese service sector.

Table 3

Estimated regression results of job stress, supervisor relationship, compensation, career development and work life balance on job satisfaction of Nepalese service sector

The results are based on 132 observations using linear regression model. The model is $JOS = \beta_0 + \beta_1 JS + \beta_2 SR + \beta_3 CMP + \beta_4 CD + \beta_5 WLB + \varepsilon$ where the dependent variable is JOS (Job satisfaction). The independent variables are JS (Job stress), SR (Supervisor relationship), CMP (Compensation), CD (Career development) and WLB (Work life balance).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		JS	SR	CMP	CD	WLB			
1	2.445 (9.181)	-0.056 (0.632)					0.005	0.918	0.399
2	1.692 (7.192)		0.350 (4.103)				0.108	0.865	16.832
3	1.941 (8.881)			0.254 (3.248)			0.068	0.884	10.549
4	1.541 (6.342)				0.399 (4.603)		0.134	0.852	21.188
5	1.739 (7.764)					0.340 (4.114)	0.108	0.865	16.921
6	1.89 (6.686)	-0.116 (1.256)	0.402 (4.246)				0.112	0.863	9.242
7	1.238 (4.473)		0.17 (1.648)	0.105 (1.254)	0.242 (2.181)		0.153	0.843	8.869
8	1.207 (4.426)		0.274 (3.207)			0.267 (3.220)	0.168	0.835	14.208
9	1.721 (5.908)	-0.099 (1.119)			0.438 (4.692)		0.135	0.852	11.241

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.
- Job satisfaction is dependent variable.

The regression results show that the beta coefficients for job stress are negative with job satisfaction. It indicates that job stress has a negative impact on job satisfaction. This finding is consistent with the findings of Sakti et al. (2024). Similarly, the beta coefficients for supervisor relationship are positive with job satisfaction. It indicates that supervisor relationship has a positive impact on job satisfaction. This finding is similar to the findings of Neubauer (2009). Likewise, the beta coefficients for compensation are positive with job satisfaction. It indicates that compensation has a positive impact on job satisfaction. This finding is consistent with the findings of Alfandi and Alkawsaneh (2014). Further, the beta coefficients for career development are positive with job satisfaction. It indicates that career development has a positive impact on job satisfaction. This finding is similar to the findings of Katharina and Dewi (2020). In addition, the beta coefficients for work life balance are positive with job satisfaction. It indicates that work life balance has a positive impact on job satisfaction. This finding is consistent with the findings of Kerdpitak and Jernsittiparsert (2020).

4. Summary and conclusion

Employee turnover is an important issue that poses a significant challenge for organizations. Since human capital is central to an organization's performance, workforce attrition can have a profound

impact on an organization's performance, growth and general business outcomes. Moreover, high turnover rates can indicate deeper systemic issues within the organization, such as poor management practices, inadequate compensation, lack of career development opportunities, or a toxic work culture. Addressing these underlying problems is essential to creating a more stable and satisfying work environment. By implementing strategies to improve employee satisfaction, such as offering competitive benefits, fostering professional growth, and promoting a positive workplace culture, organizations can reduce turnover rates and build a more committed and productive workforce.

This study attempts to examine the relationship between job satisfaction and turnover intention in Nepalese service sector. The study is based on primary data of 132 respondents.

The major conclusion of the study is that supervisor relationship, compensation, career development and work life balance have positive effect on job satisfaction of Nepalese service sector. However, job stress has a negative effect on employee job satisfaction. In addition, supervisor relationship, compensation, career development and work life balance have negative effect on employee turnover intention in Nepalese service sector. However, job stress has a positive effect on employee turnover intention. Likewise, the study also concluded that the most dominant factor that determines the employee turnover intention is work life balance in the context of Nepalese service sector.

References

- Adhikari, P. R., 2020. Employees' turnover intention in Nepalese commercial banks. *International Research Journal of Management Science* 5(1), 93-101.
- Agha, K., 2017. Work-life balance and job satisfaction: An empirical study focusing on higher education teachers in Oman. *International Journal of Social Science and Humanity* 7(3), 164-171.
- Akinyomi, O. J., 2016. Labour turnover: Causes, consequences and prevention. *Fountain University Journal of Management and Social Sciences*, 5(1), 105-112.
- Al Mamun, C. A., and M. N. Hasan, 2017. Factors affecting employee turnover and sound retention strategies in business organization: A conceptual view. *Problems and Perspectives in Management* 15(1), 63-71.
- Alfandi, A. M., and M. S. Alkashsawneh, 2014. The role of the incentives and reward system in enhancing employee's performance: A case of Jordanian travel and tourism institutions. *International Journal of Academic Research in Business and Social Sciences* 4(5), 326-341.
- Arifin, A. H., H. Raza, J. Saputra, and A. Puteh, 2020. The influence of recruitment and career development towards employee performance: A mediating role of competence. *Journal of Talent Development and Excellence* 12(1), 1040-1055.
- Arnold, E., 2015. Managing human resources to improve employee retention. *The Health Care Manager* 24(2), 132-140.
- Badar, M. R., 2011. Factors causing stress and impact on job performance: A case study of banks of Bahawalpur, Pakistan. *European Journal of Business and Management* 3(12), 9-17.
- Baqi, F. A., and R. Indradewa, 2021. The effect of compensation on job satisfaction of permanent employees and contract employees. *American International Journal of Business Management* 4(8), 144-151.
- Biswakarma, G., 2015. Employees' job engagement and turnover intentions in Nepalese private commercial banks. Empirical evidence. *Asian Journal of Research in Business Economics and Management* 5(11), 61-78.
- Blau, G., 1987. Using the theory of human capital to develop training programs for older workers. *Journal of Organizational Behavior Management* 8(2), 67-89.
- Chalise, D. R., 2019. Employee retention in Nepalese commercial banks. *Management Dynamics* 22(1), 95-106.

- Chaudhary, M. K., 2022. Rationale of employee turnover: An analysis of banking sectors in Nepal. *Talaa* 2(1), 57-63.
- Dysvik, A., and B. Kuvaas, 2013. Perceived job autonomy and turnover intention: The moderating role of perceived supervisor support. *European Journal of Work and Organizational Psychology* 22(5), 563-573.
- Eisenberger, R., R. Huntington, S. Hutchison, and D. Sowa, 1986. Perceived organizational support. *Journal of Applied Psychology* 71(3), 500-507.
- Gichungu, T., E. Mukulu, and A. Simiyu, 2024. Work environment and employee turnover in the insurance industry in Kenya. *Journal of Human Resource and Leadership* 9(2), 19-31.
- Haar, J. M., M. Russo, A. Suñe, and A. Ollier-Malaterre, 2014. Outcomes of work–life balance on job satisfaction, life satisfaction and mental health: A study across seven cultures. *Journal of Vocational Behavior* 85(3), 361-373.
- Hassan, R., 2014. Factors influencing turnover intention among technical employees in information technology organization: A case of XYZ (M) SDN. BHD. *International Journal of Arts and Commerce* 3(9), 120-137.
- Ibrar, M., and O. Khan, 2015. The impact of reward on employee performance (a case study of Malakan private school). *International Letters of Social and Humanistic* 52(1), 95-103.
- Iqbal, A., 2010. Employee turnover: Causes, consequences and retention strategies in the Saudi organizations. *The Business Review, Cambridge* 16(2), 275-281.
- Jaharuddin, N. S., and L. N. Zainol, 2019. The impact of work-life balance on job engagement and turnover intention. *The South East Asian Journal of Management* 13(1), 106-118.
- Kalidass, A., and A. Bahron, 2015. The relationship between perceived supervisor support, perceived organizational support, organizational commitment and employee turnover intention. *International Journal of Business Administration* 6(5), 82-91.
- Katharina, L. P. P., and A. A. Dewi, 2020. The effect of career development on employee performance through work satisfaction as a variable of mediation. *International Journal of Business, Economics and Law* 22(1), 1-7.
- Kemery, E. R., K. W. Mossholder, and A. G. Bedeian, 1987. Role stress, physical symptomatology, and turnover intentions: A causal analysis of three alternative specifications. *Journal of Occupational Behavior* 8(1), 11–23.
- Kerdpitak, C., and K. Jernsittiparsert, 2020. The effects of workplace stress, work-life balance on turnover intention: Empirical evidence from pharmaceutical industry in Thailand. *Systematic Reviews in Pharmacy* 11(2), 586-594.
- Lambert, E. G., N. L. Hogan, and M. L. Griffin, 2007. The impact of distributive and procedural justice on correctional staff job stress, job satisfaction and organizational commitment. *Journal of Criminal Justice* 35(6), 644-656.
- Meyer, J. P., and N. J. Allen, 1991. A three-component conceptualization of organizational commitment. *Human Resource Management Review* 1(1), 61-89.
- Milleny, N., and I. G. Adiputra, 2024. The influence of organizational culture, job stress on turnover intention with job satisfaction as an intervening variable. *Femfest International Conference on Economics, Management, and Business* 2(1), 404-416.
- Mobley, W. H., 1977. Intermediate linkages in the relationship between job satisfaction and employee turnover. *Journal of Applied Psychology* 62(2), 237–240.

- Neubauer, T., 2009. An empirical study about the status of business process management. *Business Process Management Journal* 15(2), 166-183.
- Parker, D. F., and T. A. DeCotiis, 1983. Organizational determinants of job stress. *Organizational Behavior and Human Performance* 32(2), 160-177.
- Pertiwi, N. K., and I. W. Supartha, 2021. The effect of compensation and organizational commitment on employee satisfaction and retention. *American Journal of Humanities and Social Sciences Research* 1(3), 333-342.
- Pietersen, C., and O. A. Oni, 2014. Employee turnover in a local government department. *Mediterranean Journal of Social Sciences* 5(2), 141-153.
- Saks, A. M., 2006. Antecedents and consequences of employee engagement. *Journal of Managerial Psychology* 21(7), 600-619.
- Sakti, S. H., M. Ikhsan, A. B. Pranogyo, M. N. Abdoellah, and I. Zabidi, 2024. The influence of leadership style, job stress, and job satisfaction on employee turnover intention level. *Jurnal Global Ilmiah* 1(4), 224-230.
- Samasonok, K., 2024. Employee turnover: Causes and retention strategies. *Entrepreneurship and Sustainability Issues* 11(3), 134-148.
- Samuel, M. O., and C. Chipunza, 2009. Employee retention and turnover: Using motivational variables as a panacea. *African Journal of Business Management* 3(9), 410-417.
- Santoso, A. B., S. Oktafien, D. Roespinoedji, and M. H. Saudi, 2021. Career development effect on employee performance improvement. *Review of International Geographical Education Online* 11(6), 728-734.
- Schneider, B., M. G. Ehrhart, and W. H. Macey, 2013. Organizational climate and culture. *Annual Review of Psychology* 64(1), 361-388.
- Wahyuni, N., 2016. Effect of education and training, career development and job satisfaction of employee performance at the department of education office of Gowa. *Journal of Education and Vocational Research* 7(1), 14-20.
- Winda, O., U. H. Nayati, and P. Arik, 2017. Impact of compensation and career development on job satisfaction and employee's performance. *Russian Journal of Agricultural and Socio-Economic Sciences* 64(4), 113-119.

Chapter 28

Effect of Pay for Performance on Employee Work Attitude: A case of Nepalese Commercial Banks

Apsara Imam*

Abstract

This study examines the impact of pay for performance on employee work attitude in Nepalese commercial Banks. Employee performance and job satisfaction are selected as the dependent variables. Likewise, bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness are selected as the independent variables. The primary source of data is used to assess the opinions of the respondents regarding pay for performance and work attitude in Nepalese commercial banks. The study is based on primary data with 116 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 pay for performance on employee work attitude in Nepalese commercial banks.

The study showed that bonus pay has a positive impact on employee performance and job satisfaction. This means that higher the bonus pay, higher would be the employee performance and job satisfaction. Similarly, merit pay has a positive impact on employee performance and job satisfaction indicating that increase in merit pay leads to increase in employee performance and job satisfaction. Likewise, incentive pay has a positive impact on employee performance and job satisfaction. It shows that increase in incentive pay leads to increase in employee performance and job satisfaction. Moreover, employee share ownership has a positive impact on employee performance and job satisfaction implying that increase in employee share ownership leads to increase in the level of employee performance and job satisfaction. Similarly, promotion has a positive impact on employee performance and job satisfaction. It reveals that fair promotion system leads to increase in employee performance and job satisfaction. The result also showed that performance evaluation fairness has a positive impact on employee performance and job satisfaction. It reveals that fair system of performance evaluation leads to increase in employee performance and job satisfaction.

Keywords: employee performance, job satisfaction, bonus pay, merit pay, incentive pay, employee share ownership, promotion, performance evaluation fairness.

1. Introduction

Performance-based pay (PBP) is a compensation scheme that links employee performance with pay. It can be defined as a system of remuneration in which an individual's increase in salary is solely or mainly dependent on his/her appraisal or merit rating. Pay-for-performance plans are compensation strategies that reward employees based on their job performance and contributions to the organization's success. Unlike traditional salary structures, which may be based on tenure or position, pay-for-performance plans tie compensation directly to measurable outcomes and achievements (Mercer, 2009). While pay-for-performance plans can drive higher productivity and align employee efforts with organizational goals, they must be carefully designed and managed to ensure fairness and to avoid potential pitfalls. Armstrong (2005) defined it more comprehensively as the process of providing a financial reward to an individual which is linked directly to individual, group or organizational performance. In recent decades, growing proportion of firms have included performance-based pay schemes in their compensation packages, linking pay to employee or company performance. According to Bryson *et al.* (2012), such growth in incentive pay schemes has been fueled by the concern over inefficiencies in the workplace and the belief that incentive pay can raise productivity. Pay-for-

* Ms. Imam is a Freelance Researcher, Kathmandu, Nepal.

performance is an interesting phenomenon, especially due to its potential as a basis for organization differentiation from competitors as well as a potentially powerful driver of performance (Gerhart *et al.*, 2009). However, as performance-based pay is only one dimension of employee compensation, the effects of merit or variable pay plans will most likely depend greatly on the larger compensation context (Milkovich and Wigdor, 1991).

Pay-for-performance is a fascinating concept, particularly because it serves as a distinguishing factor for organizations compared to their competitors while also acting as a powerful catalyst for enhanced performance. By directly linking compensation to measurable outcomes and individual achievements, organizations can create a highly motivated workforce that is focused on achieving specific goals and driving business success (Chingos, 2002). This approach not only helps to attract and retain top talent but also fosters a performance-oriented culture where employees are incentivized to consistently deliver their best work. Additionally, pay-for-performance plans provide financial flexibility to companies, as compensation costs are more closely tied to actual performance outcomes, reducing fixed salary expenses during less productive periods. However, the successful implementation of these plans requires careful consideration of fair and attainable performance metrics, clear communication, and alignment with organizational objectives to avoid potential drawbacks such as decreased employee morale or excessive focus on short-term results. Overall, pay-for-performance holds significant potential for differentiating organizations from their competitors and driving sustained performance improvements. Linking pay to performance is something employers increasingly seek to achieve. Jobs with performance related pay (PRP) attract workers of higher ability and induce workers to provide greater effort (Booth and Frank, 1999). There has been a discernible trend, particularly in the private sector, towards the linkage of rewards to employee performance in an attempt to enhance the achievement of organizational objectives (Mullins, 2004). In many developed economies, there has been a resurgence of interest in PRP, encouraged by governments (Perry *et al.*, 2009).

Heywood and Wei (2006) reported a positive relationship between performance-related pay and job satisfaction among youths in the Contingent pay, employee attitudes and work intensification. The use of performance-related pay enhances employees' job satisfaction and optimizes employees' work efficiency in ways that earnings from periodic salaries or hourly wages do not. Moreover, the study also reported positive links between profit-related pay and job satisfaction (Kruse, 1996). The study identified that generous rewards retain employees and ultimately lead to job satisfaction, commitment and loyalty. Salisu *et al.* (2015) reported a significant positive correlation between compensation and job satisfaction and concluded the participants participating in their study regarded rewards as one of the main contributors to their job satisfaction. Nawab and Bhatti (2011) reported that employee rewards influence job satisfaction in higher education institutions. The study also revealed that compensation as part of employee rewards is gaining popularity day by day and higher education institutions should use compensation to satisfy and retain their highly qualified academic staff. Briesacher (2009) investigated the impact of pay-for-performance systems in nursing homes. The study found that the pay-for-performance program improve resident care quality or efficiency in nursing homes as pay for performance had significant positive impact on the performance of nurses.

Pay-for-performance plans are designed to deliver pay increases to employees based on some measure of performance. Such plans offer several potential benefits. They can support the organization's personnel philosophy by helping to communicate the organization's goals to its employees. Goal theory suggests that performance-based pay plans can support a certain level of performance that is consistent with the organization's mission. They can help ensure consistency in the distribution of pay increases. To elaborate, under a plan that ties pay increases to a specific financial goal, payouts are distributed only when that goal is met (Lowery *et al.*, 1996). Motivation theory suggests that pay-for-performance can positively influence individual's performance and effort to achieve goals that are rewarded (Milkovich

and Wigdor, 1991). Beardwell and Holden (1995) identified several specific reasons for which managers may introduce PBP. These include: help in recruitment and selection; facilitate change in organizational culture; weaken trade union power; increased role of the line manager; greater financial control and value for money; ability to reward and recognize performance; and encouragement to flexibility. They have broadly categorized incentive pay systems into three: individual bonus schemes; collective bonus schemes; and collective bonus schemes based on profit generated. Chiang (2010) assessed the effects of job satisfaction, organizational commitment, and turnover intent on pay for performance. The study found that PFP (pay for performance) has significant positive relation with work satisfaction, commitment, and turnover intent. Similarly, Ibrahim and Boerhaneoddin (2010) found that job satisfaction is a significant mediator between compensation structure and organizational commitment.

Sangwan (2015) examined the impact of the compensation on the employee productivity and the employee perception and satisfaction levels towards the compensation. The study revealed that the performance of the employees depends on the existing compensation and performance management programs at an individual company. Typically, most employees respond to increases in pay and benefits with a positive and more productive attitude. However, Mamdani and Minhaj (2016), concluded that though incentives had positive impact on employees' performance; the employees were not loyal to their organizations and were willing to switch their jobs if better opportunities came their way. Darma and Supriyanto (2017) found that performance-based compensation has positive impact on employee satisfaction and employee performance at PT. Telekomunikasi Indonesia. Performance-based compensation positively impacts employee satisfaction. By directly rewarding employees for their individual contributions and achievements, this approach enhances motivation and engagement. Employees feel valued and recognized for their hard work, leading to higher job satisfaction and morale. Additionally, the opportunity to earn additional compensation based on performance can create a sense of fairness and transparency, further contributing to a positive work environment. Overall, performance-based compensation not only drives productivity but also fosters a more satisfied and committed workforce.

In the context of Nepal, Ghimire *et al.* (2023) analyzed the factor effecting employee performance and productivity in Nepalese commercial banks. The study showed that training and development, work life balance, supervisory support, compensation and physical work environment have a positive relationship with employee performance and productivity. The study concluded that compensation followed by physical work environment and supervisory support are the most influencing factors that explain the employee performance of Nepalese commercial banks. Similarly, Gurung *et al.* (2024) examined the influence of human resource management (HRM) practices on the performance of development banks (DBs) in Nepal. the results highlighted that performance appraisal (PA) had the greatest impact, followed by compensation practices (CPs), recruitment and selection (RS), and training and development (TD) on the organizational performance (OP) of DBs in Nepal. Moreover, Poudel (2023) found out that relation with colleague and allowances do not significantly affect the level of job satisfaction of human resource whereas the remaining 13 motivational factors-i.e.; salary, bonus, vehicle facility, training, job promotion, work environment, rules and regulations, loan facility, relation with superior, awards, challenging job, relation with subordinate and job security do significantly influence the employee job satisfaction.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of pay for performance on employee work attitude. 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 pay for performance on employee work attitude in the context of Nepalese commercial banks. Specifically, it examines the relationship of bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness with employee performance and job satisfaction 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 116 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on bonus pay, merit pay, incentive pay, employee share ownership, promotion, performance evaluation fairness, performance and job satisfaction in the context of Nepalese commercial banks. The study is based on descriptive and causal comparative research designs. Table 1 shows the list of sample commercial banks along with the total number of observations.

Table 1

List of sample commercial banks along with the total number of observations

S. No.	Name of banks	No. of observations
1	Sanima Bank Limited	8
2	Citizens Bank International Limited	8
3	Machhapuchchhre Bank Limited	4
4	Everest Bank Limited	7
5	Global IME Bank Limited	8
6	Himalayan Bank Limited	4
7	Kumari Bank Limited	9
8	Nabil Bank Limited	10
9	Nepal SBI Bank Limited	7
10	NIC Asia Bank Limited	9
11	NMB Bank Limited	11
12	Prabhu Bank Limited	5
13	Prime Commercial Bank Limited	6
14	Rastriya Banijya Bank Limited	4
15	Nepal Investment Mega Bank	5
16	Siddhartha Bank Limited	5
17	Laxmi Sunrise Bank Limited	6
Total number of respondents		116

Thus, study is based on the 116 observations.

The model

The model estimated in this study assumes that employee work attitude depends upon pay for performance. The dependent variables selected for the study are employee performance and job satisfaction. Similarly, the independent variables selected for the study are bonus pay, merit pay,

incentive pay, employee share ownership, promotion and performance evaluation fairness. Therefore, the models take the following forms:

$$EP = \beta_0 + \beta_1 BP + \beta_2 MP + \beta_3 IP + \beta_4 ESO + \beta_5 PR + \beta_6 PEF + e$$

$$JS = \beta_0 + \beta_1 BP + \beta_2 MP + \beta_3 IP + \beta_4 ESO + \beta_5 PR + \beta_6 PEF + e$$

Where,

EP = Employee performance

JS = Job satisfaction

BP = Bonus pays

MP = Merit pays

IP = Incentive pays

ESO = Employee share ownership

PR = Promotion

PEF = Performance evaluation fairness

Employee performance was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “My performance has improved because of the incentive pay”, “My elevated output is due to the promotion opportunity” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.947$).

Job satisfaction was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “I am gratified with the incentive pay”, “I am contented with the promotion opportunities” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.922$).

Bonus pays were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “Yearly bonus scheme in your organization is satisfactory”, “Criteria to determine the bonus in the organization is fair and transparent”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.842$).

Merit pays was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “I feel motivated to perform at a higher level due to the availability of merit pay incentives”, “The merit pay system in our organization encourages teamwork and collaboration among employees”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.865$).

Incentive pays was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “The distribution of incentives is based on employee’s performance”, “I feel that the incentive pay system contributes to a positive work culture and teamwork among employees”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.872$).

Employee share ownership was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “Employee share ownership motivates me to perform better at work”, “I believe that having a stake in the company’s success improves my job satisfaction and performance”, and so on. The reliability of the feature was measured by computing the Cronbach’s alpha ($\alpha = 0.865$).

Promotion was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “Promotion positively impacts your morale and motivation at work”, “Promotions are based on merit and performance rather than favoritism or other non-performance-related factors” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.863$).

Performance evaluation fairness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly agree and 5 for strongly disagree. There are 5 items and sample items include “The performance evaluation process in my organization is fair and transparent”, “I believe that my efforts are recognized and appreciated by my organization during performance evaluation” 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.

Bonus pays

A bonus is a gratuitous payment by the employer that is not directly earned by the employee (Eccles, 1991). Bonus Schemes are based on the Balance Score Card which is a strategic planning and management system that is used extensively in business and industry, government, and non-profit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals (Gomez-Mejia and Balkin, 2005). Banker *et al.* (2000) found that sales productivity increased following implementation of a bonus program. Similarly, Kahn and Sherer (1990) found that bonus pay positively influence the future performance and job satisfaction, although the relationship was stronger for high-level managers than for low-level ones. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship of bonus pay with employee performance and job satisfaction.

Merit pays

Merit pay relates compensation to management’s assessment of the individual employee’s performance, the increment earned and the total becomes the employee’s new basic pay. Stronge (2006) argued that merit pay or other performance pay programs provide added motivation for employees in keeping novice employees from leaving the profession after a few years and especially in retaining experienced employees. Gerhart *et al.* (2009) concluded that the merit pay is “primarily positive”. According to Park and Sturman (2012), merit pay has significant positive impact on employee performance. Similarly, Ismail *et al.* (2018) found that merit pay has significant relationship with the work outcome of the employees. By directly linking salary increases to individual achievements and job performance, merit pay incentivizes employees to strive for excellence and continually improve their work. This recognition and reward for their efforts boost motivation and engagement, leading to higher productivity and overall performance. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship of merit pay with employee performance and job satisfaction.

Incentive pays

Incentives are remuneration provided by companies that can be valued with money and have a tendency to be given regularly. Incentives are defined as forms of payment associated with performance and gain sharing, as sharing benefits for employees due to increased productivity or cost savings (Nuralfya *et al.*, 2023). Seyama and Smith (2015) found that monetary incentives are an indication of a company's gratitude for the contributions of its employees. Arokiasamy *et al.* (2013) found out that there was a positive significant relationship between reward and incentive, motivation and promotion and job satisfaction. According to Qader (2021), non-monetary incentives have significant positive effects on employees' job satisfaction and non-monetary incentives are positively correlated to job satisfaction. Likewise, incentive pay has a positive impact on the level of employee productivity (Bogaard and Svejnar, 2018). Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship of incentive pay with employee performance and job satisfaction.

Employee share ownership

Employee share ownership plan can be defined as an employee benefit scheme intended to motivate employees by giving them a stake in the firm's success through equity participation. According to Sauser (2009), the idea of employee ownership is based on the assumption that workers will put forth extraordinary efforts to ensure the economic success of their firm because compensation is linked to firm performance. Employee share ownership has positive and significant moderating effect of bank ownership on the relationship between involvement culture and employee performance in Kenya (Langat and Lagat, 2017). McCarthy *et al.* (2010) found that employee share-ownership has significant positive impact on the employee work attitude and behaviour. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship of employee share ownership with employee performance and job satisfaction.

Promotion

Herry and Noon (2001) defined promotion as getting high status in workplace by doing effective work, generally increase the status, position and remuneration of employee in the organization. Grobler *et al.* (2002) defined promotion as going towards upward position in the organization. Pay and promotions are considered most important element for the employee satisfaction (Parvin and Kabir, 2011). There is positive relationship between job satisfaction and opportunity to develop. If organization provides employees the factors of promotion like facilities, ability and skills, then employees will be automatically motivated and satisfied. Bohlander and Snell (2004) revealed that there is positive relationship between promotion and employee performance. Similarly, Yaseen (2013) revealed that there is positive relationship between promotion and employee satisfaction. Based on it, this study develops the following hypothesis.

H₅: There is a positive relationship of promotion with employee performance and job satisfaction.

Performance evaluation fairness

The successful implementation of performance pays schemes have emphasized the importance of valid job evaluation systems and fair performance evaluations. Choi and Whitford (2017) found that fair recognition of performance is positively related to three satisfaction measures: pay satisfaction, organizational satisfaction, and job satisfaction. Performance appraisal fairness and job satisfaction have positive and significant influence on job performance partially and simultaneously (Setiawati and Ariani, 2019). Taylor *et al.* (1995) found that fair treatment in performance appraisals positively affects

employees' job satisfaction and intentions to remain with their organizations. Adams (1965) stated that being treated fairly affects employee motivation and behaviors in the workplace. According to the equity theory, employees compare the ratios of their outcomes (salary or rewards) to their perceived inputs (efforts or time) to the corresponding ratios of their co-workers. When the two ratios are equal, the employees perceive their workplaces as fair, but when either ratio is greater or smaller, they perceive their workplaces as unfair (Kauhanen and Piekkola, 2006). Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship of performance evaluation fairness with employee performance and job satisfaction.

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 116 observations. The dependent variables are EP (Employee performance) and JS (Job satisfaction). The independent variables are BP (Bonus pay), MP (Merit pay), IP (Incentive pay), ESO (Employee share ownership), PR (Promotion) and PEF (Performance evaluation fairness).

Variables	Mean	SD	EP	JS	BP	MP	IP	ESO	PR	PEF
EP	3.769	0.901	1							
JS	3.524	0.850	0.562**	1						
BP	3.753	0.654	0.414**	0.475**	1					
MP	3.601	0.768	0.420**	0.585**	0.518**	1				
IP	3.620	0.779	0.425**	0.499**	0.480**	0.653**	1			
ESO	3.732	0.723	0.473**	0.408**	0.414**	0.434**	0.424**	1		
PR	3.432	0.879	0.384**	0.551**	0.365**	0.506**	0.465**	0.309**	1	
PEF	3.384	0.973	0.454**	0.654**	0.372**	0.544**	0.469**	0.337**	0.715**	1

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

Table 4 shows that bonus pay is positively correlated to employee performance. This means that higher the bonus pay, higher would be the employee performance. Similarly, merit pay is positively related to employee performance indicating that increase in merit pay leads to increase in employee performance. Likewise, incentive pay has a positive relationship with employee performance. It shows that increase in incentive pay leads to increase in the level of employee performance. Moreover, employee share ownership is positively correlated to employee performance implying that increase in employee share ownership leads to increase in the level of employee performance. Similarly, promotion has a positive relationship with employee performance. It reveals that fair promotion system leads to increase in employee performance. The result also shows that there is a positive relationship between performance evaluation fairness and employee performance. It reveals that fair system of performance evaluation leads to increase in employee performance.

The result also shows that bonus pay is positively correlated to employee job satisfaction. This means that higher the bonus pay, higher would be the job satisfaction. Similarly, merit pay is

positively related to job satisfaction indicating that increase in merit pay leads to increase in employee job satisfaction. Likewise, incentive pay has a positive relationship with employee job satisfaction. It shows that increase in incentive pay leads to increase in the level of employee job satisfaction. Moreover, employee share ownership is positively correlated to employee job satisfaction implying that increase in employee share ownership leads to increase in the level of employee job satisfaction. Similarly, promotion has a positive relationship with employee job satisfaction. It reveals that fair promotion system leads to increase in employee job satisfaction. The result also shows that there is a positive relationship between performance evaluation fairness and employee job satisfaction. It reveals that fair system of performance evaluation leads to increase in employee job satisfaction.

Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and results are presented in Table 3 and Table 4. More specifically, Table 3 shows the regression results of bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness on employee performance in Nepalese commercial banks.

Table 3

Estimated regression results of bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness on employee performance

The results are based on 116 observations from 17 sample commercial banks by using linear regression model. The model is $EP = \beta_0 + \beta_1 BP + \beta_2 MP + \beta_3 IP + \beta_4 ESO + \beta_5 PR + \beta_6 PEF + e$ where, the dependent variable is EP (Employee performance). The independent variables are BP (Bonus pay), MP (Merit pay), IP (Incentive pay), ESO (Employee share ownership), PR (Promotion) and PEF (Performance evaluation fairness).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		BP	MP	IP	ESO	PR	PEF			
1	0.909 (2.224)*	0.762 (7.101)**						0.301	0.753	50.42
2	1.21 (3.76)**		0.711 (8.133)**					0.362	0.719	66.153
3	1.261 (3.882)**			0.693 (7.893)**				0.348	0.727	62.304
4	0.959 (2.715)**				0.753 (8.11)**			0.36	0.72	65.769
5	1.87 (6.536)**					0.553 (6.854)**		0.286	0.761	46.973
6	1.96 (7.871)**						0.535 (7.558)**	0.328	0.738	57.125
7	0.493 (1.272)	0.393 (3.093)**	0.521 (4.614)**					0.406	0.694	40.344
8	0.382 (0.988)	0.345 (2.703)**	0.298 (2.017)*	0.281 (1.984)*				0.421	0.685	28.908
9	0.75 (0.196)	0.207 (1.639)	0.223 (1.585)	0.21 (1.557)	0.403 (3.807)**			0.484	0.6476	27.917
10	0.118 (0.309)	0.192 (1.532)	0.127 (0.849)	0.181 (1.343)	0.392 (3.744)**	0.062 (0.45)		0.494	0.64	23.495
11	0.07 (0.187)	0.206 (1.677)	0.056 (0.375)	0.179 (1.352)	0.392 (3.818)**	0.062 (0.45)	0.285 (2.316)*	0.514	0.628	21.251

Notes:

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

The result shows that the beta coefficients for bonus pay are positive with employee performance. It implies that the bonus pay has positive impact on employee performance. This finding is consistent with the findings of Banker *et al.* (2000). Similarly, the beta coefficients for merit pay are positive with employee performance. It implies that the merit pay has positive relationship with employee

performance. This finding is similar to the findings of Ismail *et al.* (2018). In addition, the beta coefficients for incentive pay are positive with employee performance. It implies that the incentive pay has positive impact on employee performance. This finding is consistent with the findings of Seyama and Smith (2015). Moreover, the beta coefficients for employee share ownership are positive with employee performance. It implies that the employee share ownership has positive relationship with employee performance. This finding is similar to the findings of Langat and Lagat (2017). Furthermore, the beta coefficients for promotion are positive with employee performance. It implies that the promotion has positive impact on employee performance. This finding is consistent with the findings of Yaseen (2013). Similarly, the beta coefficients for performance evaluation fairness are positive with employee performance. It implies that the performance evaluation fairness has positive relationship with employee performance. This finding is similar to the findings of Taylor *et al.* (1995).

Table 4 shows the estimated regression results of bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness on job satisfaction in the context of Nepalese commercial banks.

Table 4

Estimated regression results bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness on job satisfaction

The results are based on 116 observations from 17 sample commercial banks by using linear regression model. The model is $JS = \beta_0 + \beta_1 BP + \beta_2 MP + \beta_3 IP + \beta_4 ESO + \beta_5 PR + \beta_6 PEF + e$ where, the dependent variable is JS (Job satisfaction). The independent variables are BP (Bonus pay), MP (Merit pay), IP (Incentive pay), ESO (Employee share ownership), PR (Promotion) and PEF (Performance evaluation fairness).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		BP	MP	IP	ESO	PR	PEF			
1	0.349 (0.993)	0.846 (9.165)**						0.419	0.648	83.99
2	0.63 (2.401)*		0.803 (11.265)**					0.523	0.587	126.906
3	0.934 (3.225)**			0.715 (9.142)**				0.418	0.648	83.58
4	1.102 (3.159)**				0.649 (7.073)**			0.299	0.712	50.022
5	1.179 (5.193)**					0.683 (10.658)**		0.495	0.604	113.598
6	1.207 (6.751)**						0.685 (13.484)**	0.611	0.530	181.808
7	0.133 (0.435)	0.419 (4.162)**	0.579 (6.751)**					0.582	0.549	81.2
8	0.182 (0.589)	0.398 (3.885)**	0.49 (4.139)**	0.124 (1.095)				0.583	0.549	54.628
9	0.363 (1.125)	0.343 (3.239)**	0.46 (3.89)**	0.096 (0.849)	0.159 (1.79)			0.591	0.543	42.58
10	0.446 (1.501)	0.313 (3.212)**	0.27 (2.326)*	0.038 (0.364)	0.139 (1.697)	0.34 (4.641)**		0.655	0.499	44.675
11	0.363 (1.387)	0.338 (3.941)**	0.147 (1.412)	0.034 (0.373)	0.139 (1.933)	0.069 (0.724)	0.497 (5.777)**	0.733	0.439	53.748

Notes:

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

The result shows that the beta coefficients for bonus pay are positive with job satisfaction. It implies that the bonus pay has positive impact on employee job satisfaction. This finding is consistent with the findings of Kahn and Sherer (1990). Similarly, the beta coefficients for merit pay are positive with job satisfaction. It implies that the merit pay has positive relationship with employee job satis-

faction. This finding is similar to the findings of Park and Sturman (2012). In addition, the beta coefficients for incentive pay are positive with employee job satisfaction. It implies that the incentive pay has positive impact on employee job satisfaction. This finding is consistent with the findings of Qader (2021). Moreover, the beta coefficients for employee share ownership are positive with employee job satisfaction. It implies that the employee share ownership has positive relationship with employee job satisfaction. This finding is similar to the findings of McCarthy *et al.* (2010). Furthermore, the beta coefficients for promotion are positive with employee job satisfaction. It implies that the promotion has positive impact on employee job satisfaction. This finding is consistent with the findings of Bohlander and Snell (2004). Similarly, the beta coefficients for performance evaluation fairness are positive with employee job satisfaction. It implies that the performance evaluation fairness has positive relationship with employee job satisfaction. This finding is similar to the findings of Choi and Whitford (2017).

4. Summary and conclusion

Performance-based pay can lead to higher levels of engagement as employees become more involved in their tasks and the overall success of the organization. Engaged employees are more likely to be proactive, innovative, and dedicated to their roles. Performance-based compensation systems often come with clear performance metrics and expectations. This clarity helps employees understand what is required of them, leading to a more focused and accountable workforce. However, it is essential to design and implement pay-for-performance plans carefully to avoid potential drawbacks such as increased stress, unhealthy competition, or perceptions of unfairness. Ensuring transparency, fairness, and attainable performance metrics are key to maximizing the positive effects on employee work attitudes.

This study attempts to analyse the effect of pay for performance on employee work attitude of Nepalese commercial banks. The study is based on primary data of 17 commercial banks with 116 respondents.

The major conclusion of study is that bonus pay, merit pay, incentive pay, employee share ownership, promotion and performance evaluation fairness have positive effect on employee performance and job satisfaction in the context of Nepalese commercial banks. Employees are more likely to put in extra effort and strive for excellence when they know their performance directly impacts their compensation. This can lead to higher productivity and a stronger commitment to organizational goals. The study concludes that employee share ownership followed by performance evaluation fairness is the most dominant factor that influences the employee performance in the context of Nepalese commercial banks. Similarly, the study also concludes that the most determining factor that influence the job satisfaction are bonus pay followed by performance evaluation fairness.

References

- Adams, J. S., 1965. Inequity in social exchange. *Advances in Experimental Social Psychology* 2(1), 267–299.
- Armstrong, M., 2005. *A Handbook of Human Resource Management Practice*, 5th Ed. (Kogan Page, Ohio).
- Arokiasamy, A. R. A., H. H., Tat, and A. Abdullah, 2013. The effects of reward system and motivation on job satisfaction: evidence from the education industry in Malaysia. *World Applied Sciences Journal* 24(12), 1597-1604.
- Banker, R., S. Lee, G. Potter, and D. Srinivasan, 2000. An empirical analysis of continuing improvements following the implementation of a performance-based compensation plan. *Journal of Accounting and Economics* 30(1), 315-350.
- Beardwell, I., and L. Holden, 1995. *Human Resource Management: A Contemporary Perspective* (Pitman

- Publishing, London).
- Bogaard, H., and J. Svejnar, 2018. Incentive pays and performance: Insider econometrics in a multi-unit firm. *Labour Economics* 54(1), 100-115.
- Bohlander, G., and S. Snell, 2004. Implementing compensation and security. *Managing Human Resources* 6(1), 439-442.
- Booth, A. L., and J. Frank, 1999. Earnings, Productivity and Performance-Related Pay. *Journal of Labour Economics*, 17 (3), 447-463.
- Briesacher, B. A., T. S. Field, J. Baril, J. H. and Gurwitz, 2009. Pay-for-performance in nursing homes. *Health Care Financing Review*, 30(3), 1-11.
- Bryson, A. R., C. Freeman, M. Lucifora, and V. Perotin, 2012. Paying for performance: incentive pay schemes and employees' financial participation. *CEP Discussion Paper*, 1112.
- Chiang, F. F., and T. A. Birtch, 2010. Pay for performance and work attitudes: The mediating role of employee-organization service value congruence. *International Journal of Hospitality Management* 29(4), 632-640.
- Chingos, P. T., 2002. *Paying for Performance: A Guide to Compensation Management* (John Wiley and Sons, New York).
- Choi, S., and A. B. Whitford, 2017. Employee satisfaction in agencies with merit-based pay: Differential effects for three measures. *International Public Management Journal* 20(3), 442-466.
- Darma, P. S., and A. S. Supriyanto, 2017. The effect of compensation on satisfaction and employee performance. *Management and Economics Journal* 1(1), 69-77.
- Eccles, R. G., 1991. The performance measurement manifesto. *Harvard Business Review* 69(1), 131-137.
- Gerhart, B., S. L. Rynes, and I. S. Fulmer, 2009. Pay and performance: Individuals, groups, and executives. *Academy of Management Annals* 3(1), 251-315.
- Ghimire, B., R. K. Dahal, B. Rai, and D. Upadhyay, 2023. Employee performance factors in the Nepalese commercial banks: Insights from emerging markets. *Journal of Logistics, Informatics and Service Science* 10(2), 29-42.
- Gomez-Mejia, L. and D. Balkin, 2005. Effectiveness of individual and aggregate compensation strategies. *Industrial Relations* 28(1), 431-445.
- Grobler, P.A., S. Warnich, M. R. Carrell, N. F. Elbert, and R. D. Hatfield, 2002. *Human Resource Management*, 2nd Edition (Thomson Learning, London).
- Gurung, R., B. Ghimire, R. K. Dahal, and S. B. Magar, 2024. Human resource management practices and its impact on organizational performance in development banks: the emerging market case. *Journal of Governance and Regulation* 13(2), 116-125
- Herry, E., and M. Noon, 2001. *A Dictionary of Human Resource Management* (Oxford University Press, New York).
- Heywood, J., and X. Wei, 2006. Performance pays and job satisfaction. *Journal of Industrial Relations* 48(1), 523-540.
- Ibrahim, I. I., and A. Boerhaneoddin, 2010. Is job satisfaction mediating the relationship between compensation structure and organizational commitment? A study in the Malaysian power utility. *Journal of Global Business and Economics* 1(1), 43-61.
- Ismail, A., N. I. K. Nik Mahdi, N. Mat, M. H. Ali, and N. A. A. Mohd Ali, 2018. Administration of the merit pay systems enhancing work outcomes. *Asian Journal of Accounting and Governance* 9(1), 99-109.

- Kahn, L., and P. Sherer, 1990. Contingent pay and managerial performance. *Industrial and Labor Relations Review* 43(1), 107-120.
- Kauhanen, A., and H. Piekkola, 2006. What makes performance-related pay schemes work? Finnish Evidence. *Journal of Management and Governance* 10(2), 149-177.
- Kruse, D., 1996. Why do firms adopt profit-sharing and employee ownership plans? *British Journal of Industrial Relations* 34(4), 515-538.
- Langat, E., and C. Lagat, 2017. Effect of organizational ownership and culture on employee performance among selected banks in Kenya. *European Scientific Journal* 13(13), 409-425.
- Lowery, C. M., M. M. Petty, and J. W. Thompson, 1996. Assessing the merit of merit pay: employee reactions to performance-based pay. *Human Resource Planning* 19(1), 1-26.
- Mamdani, K. F., and S. Minhaj, 2016. Effects of motivational incentives on employees' performance: A case study of banks of Karachi, Pakistan. *South East Asia Journal of Contemporary Business, Economics and Law* 9(2), 32-39.
- McCarthy, D., E. Reeves, and T. Turner, 2010. Can employee share-ownership improve employee attitudes and behaviour? *Employee Relations* 32(4), 382-395.
- Mercer, L. L. C., 2009. *Pay for Results: Aligning Executive Compensation with Business Performance* (John Wiley and Sons, New York).
- Milkovich, G., and A. Wigdor, 1991. *Evaluating Performance Appraisal and Merit Pay* (The National Academies Press, Washington, DC).
- Mullins, L., 2004. *Organizational Behaviour, 6th Edition* (Irwin, Boston).
- 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.
- Nuralfya, A., W. B. Priatna, and B. Burhanuddin, 2023. Factors affecting productivity of plantation employees at Pt. Great Giant Pineapple, Central Lampung. *Agricultural Socio-Economics Journal* 23(2) 141-150.
- Park, S., and M. C. Sturman, 2012. How and what you pay matters: The relative effectiveness of merit pay, bonuses and long-term incentives on future job performance. *Compensation and Benefits Review* 44(2), 80-85.
- Parvin, M. M., and M. N. Kabir, 2011. Factors affecting employee job satisfaction of pharmaceutical sector. *Australian Journal of Business and Management Research* 1(9), 113-123.
- Perry, J. L., T. A. Engbers, and S. Y. Jun, 2009. Back to the Future? Performance-related pay, empirical research, and the perils of resistance. *Public Administration Review* 69(1), 33-51.
- Poudel, B., 2023. An empirical study on factors influencing job satisfaction of human resource in bank and insurance companies of Nepal. *Arabian Journal of Business and Management Review (Kuwait Chapter)* 12(1), 11-22.
- Qader, A. N., 2021. The effect of non-monetary incentives and work environment on employee's job satisfaction. *Studies of Applied Economics* 39(7), 1-13.
- Salisu, J. B., E. Chinyio, and S. Suresh, 2015. The impact of compensation on the job satisfaction of public sector construction workers of Jigawa state of Nigeria. *The Business and Management Review* 6(4), 282-291.
- Sangwan, S., 2015. Impact of compensation management practices on employee's performance in private sector banks. *International Journal of Management Research and Business Strategy* 4(3), 270-273.
- Sauser, J. W., 2009. Sustaining employee-owned companies: Seven recommendations. *Journal of Business Ethics*

84(1), 151–164.

- Setiawati, T., and I. D. Ariani, 2020. Influence of performance appraisal fairness and job satisfaction through commitment on job performance. *Review of Integrative Business and Economics Research* 9(3), 133-151.
- Seyama, S.M., and C. Smith, 2015. ‘Not worth the sweat’ rewards at a South African university. *Indo-Pacific Journal of Phenomenology* 15(2), 1–13.
- Stronge, N., 2006. Interdependence, differential rewarding, and productivity. *American Sociological Review* 28(1), 768-778.
- Yaseen, A., 2013. Effect of compensation factors on employee satisfaction-a study of doctor’s dissatisfaction in Punjab. *International Journal of Human Resource Studies* 3(1), 142-157.

Chapter 29

The Effect of Training Dimensions on Employee Work Performance in Nepalese Manufacturing Sector

Susmita Kasaudhan*

Abstract

This study examines the effect of training dimensions on employee work performance in Nepalese manufacturing sector. Employee's work performance is the dependent variable. The selected independent variables are training period, trainer behavior, training workplace, training design and training evaluation. The study is based on primary data with 141 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression model are estimated to test the significance and importance of the training dimensions on employee work performance in Nepalese manufacturing sector.

The study showed that training design has a positive effect on employee's work performance. It indicates that better design of the training programs leads to increase in employee's work performance. Similarly, training period has a positive effect on employee's work performance. It indicates that increase in required training period leads to increase in employee's work performance. In addition, training workplace has a positive effect on employee's work performance. It indicates that better workplace for training leads to increase in employee's work performance. Further, training evaluation has a positive effect on employee's work performance. It indicates that fair system of training evaluation leads to increase in employee's work performance. In addition, trainer behavior has a positive effect on employee's work performance. It indicates that better the trainer behavior, higher would be the level of employee's work performance.

Keywords: training period, trainer behavior, training workplace, training design, training evaluation

1. Introduction

Training and development are like a root toward a success and better result. It holds significant importance in any organization despite of its size (Ahmad *et al.*, 2014). Training is a pre-planned study of an organization with the objective of learning to develop employees' competencies, skills, knowledge, and behavior in their day-to-day operations at the level required by the organization (Parent-Lamarche *et al.*, 2023). Employees may be trained to enhance certain competencies that will help them work in their current position. Training has specific goals of improving one's capability, capacity, productivity and performance. Positive trainer behaviors such as effective communication, supportive feedback, engagement, empathy, professionalism, and motivation can significantly enhance employees' ability to perform their jobs effectively. The design of training programs plays a crucial role in determining their effectiveness and the extent to which they improve employee work performance. By focusing on needs assessment, clear objectives, engaging content, practical application, feedback, follow-up, customization, and the use of technology, organizations can create training programs that significantly enhance employee skills and performance. The training environment in the workplace plays a vital role in shaping employee work performance. Rajasekar and Khan (2013) argued that employee training and development is one of the essential parts of human resources management with the identification of organizational need, technique and procedure at different industrial perspectives. A supportive culture, access to resources, managerial support, collaborative learning opportunities, real-

* Ms. Kasaudhan is a Freelance Researcher, Kathmandu, Nepal.

world application, a positive physical environment, regular feedback, and recognition all contribute to creating an effective training environment. When employees are provided with a conducive training environment, they are more likely to acquire and apply new skills, leading to improved job performance and overall organizational success. The relationship between training duration and employee performance is complex and context-dependent. While longer training programs can offer more comprehensive learning and better retention, there is an optimal duration that balances thorough coverage with engagement and practical application. Organizations should consider the nature of the skills being taught, the learning needs of employees, and the goal of the training when determining the appropriate duration to maximize performance outcomes (Molina-Castillo et al., 2023).

Effective training programs can significantly impact employee performance. Training programs help employees adapt to changes in technology, processes, or industry standards. Khan *et al.* (2011) examined the impact of training and development on organizational performance. The results showed that training and development, on the job training, training design and delivery style have significant effect on employee performance and all these have positively affected the organizational performance. In fast-paced environments where change is constant, ongoing training ensures that employees remain up-to-date and capable of meeting evolving job requirements, thus enhancing their performance. Employees who undergo training are better equipped to handle their job responsibilities with confidence and competence. They understand the best practices, procedures, and protocols relevant to their roles, leading to increased job proficiency and productivity. Job security has a significant effect on the success of an organization through improving employee performance (Mozael, 2015). Employee training plays a crucial role in enhancing performance at both individual and organizational levels. By providing employees with the necessary skills, knowledge, and support to excel in their roles, training programs contribute to increased productivity, motivation, engagement, and overall success. Organizations that prioritize employee training and development are better positioned to adapt to change, innovate, and achieve their strategic objectives. Oluwaseun (2018) investigated the effect of employee training and development on organizational success. The study found that training and development is positively and statistically significant with employee performance and effectiveness and can advance organizational growth and success.

Chukwuemeka and Endurance (2022) revealed a high influence of training and development on employees' performance. The study found that on-the-job and off-the-job training influence the productivity of employees. The study also established that training and development positively influence employees' job knowledge and the work quality of employees. Training equips employees with the necessary knowledge, skills, and competencies to perform their job duties effectively. Whether it's technical skills, soft skills, or job-specific knowledge, training provides employees with the tools they need to excel in their roles. Younas et al. (2018) found that there is a positive relationship between training and development and employee performance. Training programs help employees adapt to changes in technology, processes, or industry standards. In fast-paced environments where change is constant, ongoing training ensures that employees remain up-to-date and capable of meeting evolving job requirements, thus enhancing their performance. Skills erode and become obsolete over a period of time and has to be replenished (Nda and Fard, 2013). Therefore, training and development are very essential at all employee levels. Properly trained employees are less likely to make errors or mistakes in their work. Training helps employees understand potential pitfalls, safety protocols, and quality standards, leading to a decrease in costly errors and rework, and improving overall performance. Further, Akudo (2020) found that there is a high positive and significant relationship between staff training and development and teachers' performance in secondary schools in Anambra State.

Training and development are crucial for preparing employees to contribute more effectively

to the organization. By investing in employee growth and providing opportunities for learning and skill development, organizations can enhance employee performance, job satisfaction, innovation, and ultimately, achieve their strategic goals and objectives. Imran and Tanveer (2015) revealed that training and development prepare the employees to contribute more to the organization. Similarly, training and development have a positive impact on employee performance in the banks of Pakistan. Moreover, Bao and Nizam (2015) found training and development, reward and recognition and delegation of authority have significant impact on performance of employees. Training and development initiatives can be designed to align with the organization's strategic goals and objectives. By focusing on developing skills and competencies that are directly relevant to the organization's mission and vision, employees are better prepared to contribute to achieving organizational success. Ugbomhe *et al.* (2016) explained that appropriate training and development of banking staff can result in efficient performance of their functions. The study suggested that management should define an appropriate training and development programs for each category of staffs who need to be trained and developed. In addition, Dimba (2010) found that employee's training has significantly affected the morale and the motivation level of staff members in the context of retail sector. The study also found that training influences ability and capabilities of staff members for managing various job operations.

In today's dynamic business environment, organizations must be agile and adaptable to change. Training and development programs help employees stay current with new technologies, industry trends, and market developments, enabling the organization to adapt quickly to changing circumstances and remain competitive. Riaz *et al.* (2013) concluded that there exists a positive relationship between organizational commitment and employee perception of benefits of training. The result also concluded that employees are more committed to employers who have positive attitude towards training as compared to those employees who take training as a leisure activity. Asfaw *et al.* (2015) found that the employee training and development activity shall be based on a systematically identified knowledge and skill deficit so as it maximizes the effort of the both the employee and organization. Similarly, Karim *et al.* (2019) revealed that training and development of all staff should be dynamically followed and made obligatory and the employer should give compulsory training programs for all employees in order to improve performance. However, Shafiq and Hamza (2017) concluded that on job training, off job training, job enrichment and job rotation have an insignificant impact on employee performance except job enrichment which is reported to have a significant impact on the employee performance.

In the context of Nepal, Adhikari (2023) argued that better on-the-job training programs leads to increase in employee performance and increase in job rotation system leads to increase in employee performance. Similarly, Maharjan (2013) stated that a firm's competitiveness depends on its capacity to manage performance and improve the development of the skills and competencies of employees by creating a learning environment. Gautam (2013) showed a positive relationship between training and development and employees' performance. The result also showed that high assessment organizations of Nepal are doing better than low assessment organizations. Moreover, Chataut (2018) showed that there is a positive impact of training and development on employee performance in Nepalese commercial banks. Chalise (2020) found that there is a positive and significant relationship between training and development and organizational performance. Similarly, Chapagai (2011) revealed that training and development is an important determinant of employee performance. The study also found that increased training and development practices have positive impact on employee performance and productivity of Nepalese commercial banks. Likewise, Baniya (2004) revealed that the positive consequences of providing training and development opportunities to employees are improved performance, increased productivity, enhanced loyalty towards organization and increased motivation among employees' and negative consequences are demand for increment in salary, additional incentives and facilities, promotion and demonstration of over confidence in work and tendency to leave job.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the effect of training dimensions on employee work performance. 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 training dimensions on employee work performance in Nepalese manufacturing sector. Specifically, it examines the impact of training period, trainer behavior, training workplace, training design and training evaluation on employee work performance in Nepalese manufacturing sector.

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 141 respondents through questionnaire. The study considered convenience sampling method. The respondents' views were collected on training period, trainer behavior, training workplace, training design and training evaluation. The study is based on descriptive as well as causal comparative research designs.

The model

The model used in this study assumes that the employee's work performance of manufacturing sector depends upon training dimensions. The dependent variable selected for the study is employee's work performance. Similarly, the selected independent variables are training period, trainer behavior, training workplace, training design and training evaluation. Therefore, the models take the following forms.

$$EWP = \beta_0 + \beta_1 TP + \beta_2 TB + \beta_3 TW + \beta_4 TD + \beta_5 TE + \varepsilon$$

Where,

EWP = Employee's work performance

TP = Training period

TB = Trainer behavior

TW = Training workplace

TD = Training design

TE = Training evaluation

Training period was measured using a 5-point Likert scale where 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 period prepare me very well for my role", "Overall, I am satisfied with the training period" and so on. The reliability of the items was measured by computing the Cronbach's alpha ($\alpha = 0.716$).

Trainer behavior 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 trainer effectively communicated the material”, “The trainer demonstrated patience and understanding towards participants” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.796$).

Training workplace 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 training workplace provided a conducive environment for learning”, “The facilities and resources available in the training workplace were adequate for the training sessions”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.773$).

Training 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 are 5 items and sample items include “The training materials were organized and easy to follow,” “The training content was relevant and applicable to my job role” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.777$).

Training evaluation 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 evaluation process was clear and easy to understand,” “The evaluation criteria effectively measured my understanding of the training content”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.759$).

Employee’s work 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 5 items and sample items include “The training has effectively improved my job performance”, “The training prepared me very well to handle tasks and challenges specific to my role”, and so on. The reliability of the items was measured by computing the Cronbach’s alpha ($\alpha = 0.845$).

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

Training period

Balancing duration to keep employees engaged and motivated is crucial for effective learning and performance improvement. Uma (2013) analyzed the training importance for employees of their successful performance in the organization. The results showed that longer training periods allow for a more in-depth exploration of the subject matter. Employees have more time to grasp concepts thoroughly, which can lead to better performance when they apply these concepts in their work. According to Girdwichai and Sriviboon (2020), extending the training period provides employees with additional opportunities to practice new skills. The study also found that the duration of training programs was positively related to training outcomes, but with diminishing returns beyond a certain point. This suggests that while longer training can enhance learning, there is an optimal duration beyond which additional time may not significantly improve performance. Danvila del Valle et al. (2009) revealed that longer training periods allow for spaced repetition, which is known to enhance the retention of information. Employees are more likely to remember and apply what they’ve learned when the training is spread out over time. Based on it, this study develops following hypothesis:

H_1 : There is a positive relationship between training period and employee work performance.

Training workplace

A workplace that fosters a culture of continuous learning and development encourages employees to engage in training programs. Employees will be able to perform their duties and work without interruption in a clean, comfortable, and pleasant work environment. This situation boosts employee morale, which allows work to be completed on time and the company's goals to be met (Zuana, 2014). Creating a comfortable and pleasant work environment during training, both physically and virtually, is one effort to increase employee professionalism at work (Purwati, 2017). A conducive training environment ensures that employees can effectively acquire and apply new skills and knowledge, leading to improved job performance. Professional employees will strive to improve their performance in order to achieve the company's goals. According to Chandrasekar (2011), workplace design needs to take into account of a wide range of issues. The study concluded that a well develop work environment can make an employee enjoy their workplace, thus, increase their performance. Providing employees with the necessary resources, such as training materials, access to online courses, and dedicated time for learning, is essential. A well-equipped training environment enables employees to fully engage in the learning process and gain the skills needed for improved performance. Based on it, this study develops following hypothesis:

H₂: There is a positive relationship between training workplace and employee work performance.

Training design

Training design involves the planning and structuring of training programs to ensure they effectively address the needs of employees and the organization. The training strategy and associated physical and educational procedures need to relate to the goal of the transfer (Lim and Johnson, 2002). Effective training design starts with a thorough needs assessment to identify the skills, knowledge, and competencies employees need to improve. By aligning training programs with these needs, organizations can ensure that the training is relevant and directly applicable to employees' job roles, leading to better performance. The training design should compare staff capabilities, teach the educational material and assist workers to use the advantages and skills gained beyond the training environment (Tannenbaum and Yukl, 1992). Nikandrou *et al.* (2009) identified that the training scheme and its procedure could be established with learners and thus would be able to display prominent ability in training exchange. Training programs that incorporate engaging and interactive content are more likely to capture employees' attention and facilitate learning. Effective training design includes follow-up sessions and reinforcement activities to ensure that learning is retained and applied over time. This can include refresher courses, on-the-job coaching, and access to additional resources, which help sustain performance improvements. Based on it, this study develops following hypothesis:

H₃: There is a positive relationship between training design and employee work performance.

Trainer behavior

Gauld and Miller (2004) suggested that a qualified trainer possesses two essential features: reliability and effectiveness. Trainers who communicate clearly and effectively help employees understand their roles, responsibilities, and the skills they need to develop. This clarity leads to better performance as employees are more likely to know what is expected of them and how to achieve it. Supportive trainers who provide guidance and encouragement can boost employees' confidence and motivation, leading to enhanced performance (Lim and Johnson, 2002). Trainers who demonstrate empathy and understand employees' individual needs and challenges can tailor their training methods to better suit those needs. This personalized approach can lead to more effective learning and better

job performance. Cheng and Hampson (2008) argued that firms' training programs may not have a positive impact on trainees' performance unless the newly acquired knowledge, skills and behaviors are transferred to their everyday work activities, tasks and duties. Based on it, this study develops following hypothesis:

H₄: There is a positive relationship between trainer behavior and employee work performance.

Training evaluation

Training evaluation plays a crucial role in providing feedback regarding how a specific training program was offered. Training evaluation is a process to determine whether the design and delivery of the training programs have been met (Shaheen *et al.*, 2013). A good evaluation gives useful information to different stakeholders, namely, training providers, trainees/employees, management and other stakeholders (Chan, 2016). Likewise, Shwerani and Mohammed (2015) suggested that there is a positive relationship between training evaluation and performance. Training evaluations help determine whether the training program has successfully imparted the necessary skills and knowledge to employees. Through evaluation, organizations can identify specific areas where employees may still lack proficiency. Addressing these gaps through targeted follow-up training or support ensures that employees have the complete skill set needed to perform their jobs effectively. In addition, Farooq and Khan (2011) concluded that the training and feedback can increase the performance level of all sorts of the organizations. Based on it, this study develops following hypothesis:

H₅: There is a positive relationship between training evaluation and employee work 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 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 141 observations. The dependent variable is EWP (Employee's work performance). The independent variables are TD (Training design), TP (Training period), TW (Training workplace), TE (Training evaluation) and TB (Trainer behavior).

Variables	Mean	SD	EWP	TD	TP	TW	TE	TB
EWP	2.868	1.040	1					
TD	2.899	0.932	0.334**	1				
TP	2.956	0.843	0.342**	0.400**	1			
TW	2.900	0.777	0.412**	0.456**	0.455**			
TE	2.883	0.896	0.0366**	0.390**	0.403**	0.469**	1	
TB	3.017	0.944	0.410**	0.381**	0.398**	0.463**	0.422**	1

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

Table 1 shows that training design is positively correlated to employee's work performance. It indicates that better design of the training programs leads to increase in employee's work performance. Similarly, training period has a positive relationship with employee's work performance. It indicates

that increase in required training period leads to increase in employee's work performance. In addition, training workplace has a positive relationship with employee's work performance. It indicates that better workplace for training leads to increase in employee's work performance. Further, training evaluation is positively correlated to employee's work performance. It indicates that fair system of training evaluation leads to increase in employee's work performance. In addition, trainer behavior is positively correlated to employee's work performance. It indicates that better the trainer behavior, higher would be the level of employee's work performance.

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 training design, training period, training workplace, training evaluation and trainer behavior on employee's work performance in manufacturing sector.

Table 2

Estimated regression result of training design, training period, training workplace, training evaluation and trainer behavior on employee's work performance

The results are based on 141 observations using linear regression model. The model is $EWP = \beta_0 + \beta_1 TP + \beta_2 TB + \beta_3 TW + \beta_4 TD + \beta_5 TE + \varepsilon$ where the dependent variable is EWP (Employee's work performance). The independent variables are TD (Training design), TP (Training period), TW (Training workplace), TE (Training evaluation) and TB (Trainer behavior).

Model	Intercept	Regression coefficients of					Adj. R _{bar} ²	SEE	F-value
		TD	TP	TW	TE	TB			
1	1.218 (4.913)	0.569 (6.991)**					0.255	0.898	48.881
2	1.082 (3.864)*		0.604 (6.628)**				0.235	0.91	43.925
3	0.619 (2.226)*			0.776 (8.378)**			0.331	0.851	70.193
4	0.966 (3.951)				0.66 (8.144)**		0.318	0.859	66.32
5	1.000 (4.093)*					0.619 (8.006)**	0.311	0.863	64.099
6	0.702 (2.475)	0.380 (3.936)**	0.360 (3.382)**				0.307	0.866	31.996
7	0.270 (0.923)	0.216 (2.139)**	0.189 (1.710)*	0.487 (3.888)**			0.371	0.824	28.55
8	0.146 (0.507)	0.142 (1.404)**	0.124 (1.128)	0.359 (2.785)*	0.313 (3.000)**		0.406	0.801	24.912
9	0.051 (0.179)	0.097 (0.961)**	0.076 (0.697)	0.298 (2.315)*	0.246 (2.327)**	0.244 (2.507)	0.428	0.786	21.962

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's work performance is dependent variable.

The regression results show that beta coefficients for training design are positive with employee's work performance. It indicates that training design has a positive impact on employee's work performance. This finding is consistent with the findings of Nikandrou *et al.* (2009). Similarly, the beta coefficients for training period are positive with employee's work performance. It indicates that training period has a positive impact on employee's work performance. This finding is similar to the findings of Girdwichai and Sriviboon (2020). Likewise, the beta coefficients for training workplace are

positive with employee's work performance. It indicates that training workplace has a positive impact on employee's work performance. This finding is consistent with the findings of Chandrasekar (2011). Further, the beta coefficients for training evaluation are positive with employee's work performance. It indicates that training evaluation has a positive impact on employee's work performance. This finding is similar to the findings of Shwerani and Mohammed (2015). In addition, the beta coefficients for trainer behavior are positive with employee's work performance. It indicates that trainer behavior has a positive impact on employee's work performance. This finding is not similar to the findings of Cheng and Hampson (2008).

4. Summary and conclusion

Training and development programs provide employees with opportunities to acquire new skills, knowledge, and competencies relevant to their roles. Whether it's technical skills, soft skills like communication and leadership, or industry-specific knowledge, ongoing learning ensures that employees are equipped to tackle their responsibilities with confidence and proficiency. Well-trained employees are more efficient and effective in their work. They understand best practices, processes, and procedures, leading to higher levels of productivity and performance. Additionally, ongoing development ensures that employees remain up-to-date with industry trends and innovations, allowing them to perform at their best in a rapidly changing environment.

This study attempts to examine the effect of training dimensions on employee work performance in Nepalese manufacturing sector. The study is based on primary data with 141 respondents.

The major conclusion of the study is that training design, training period, training workplace, training evaluation and trainer behaviour have positive effect on employee work performance. It implies that the design of training programs, the duration of training, the training environment within the workplace, the evaluation of training effectiveness, and the behavior of trainers all play crucial roles in enhancing employee performance. Moreover, investing in training initiatives that provide ample opportunities for learning, practice, and feedback within a supportive and conducive work environment can lead to notable improvements in employee performance. Furthermore, the study showed that cultivating a culture of continuous learning and development, supported by knowledgeable and supportive trainers, can foster employee engagement, motivation, and ultimately, contribute to sustained high performance across the organization. The study also concluded that the well-designed, effectively implemented training programs and supportive trainer behaviours play in maximizing employee potential and driving organizational success. By prioritizing these factors, organizations can create an environment where employees are empowered to excel and contribute meaningfully to achieving strategic objectives and maintaining a competitive edge in today's dynamic business landscape.

References

- Adhikari, Y., 2023. Impact of training and development of employees' performance in Nepalese commercial banks. *Perspectives in Nepalese Management* 1(1), 417-428.
- Ahmad, S., M. Ahmad, and R. A. Asghar, 2014. Impact of training and development on employee performance. *Arabian Journal of Business and Management Review* 2(4), 19-24.
- Akudo, F. U., 2020. Relationship between staff training and development and teachers' performance in secondary schools in Anambra state. *Unizik Journal of Educational Research and Policy Studies* 1(1), 65-74.
- Asfaw, A. M., M. D. Argaw, and L. Bayissa, 2015. The impact of training and development on employee performance and effectiveness: A case study of district five administration office, Bole Sub-City, Addis

- Ababa, Ethiopia. *Journal of Human Resource and Sustainability Studies* 3(4), 188-205.
- 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.
- Bao, C., and I. Nizam, 2015. The impact of motivation on employee performance in the electronics industry in China. *International Journal of Accounting and Business Management* 3(2), 29-45.
- Chalise, D. R., 2020. Training and development in Nepalese commercial banks. *Management Dynamics* 23(1), 93-104.
- Chan, K. C. M., 2016. A critical analysis of a program evaluation: A case study on the effectiveness of a teacher training program. *Asian Journal of Educational Research* 4(5), 24-33.
- Chandrasekar, K., 2011. Workplace environment and its impact on organizational performance in public sector organizations. *International Journal of Enterprise Computing and Business Systems* 1(1), 1-19.
- Chapagai, R. R., 2011. Impact of employee participation on job satisfaction in Nepalese commercial banks. *PYC Nepal Journal of Management* 4(1), 39-51.
- Chataut, R., 2018. Impact of training and development on employee performance in Nepalese commercial banks. *Nepalese Journal of Management* 5(4), 63-71.
- Cheng, E. W., and I. Hampson, 2008. Transfer of training: A review and new insights. *International Journal of Management Reviews* 10(4), 327-341.
- Chukwuemeka, O., and G. W. Endurance, 2022. Impact of Training and Development on Employees' Performance in Epenal Group Ltd. *International Journal on Integrated Education* 5(5), 281-293.
- Danvila del Valle, I., M. Ángel Sastre Castillo, and A. Rodríguez-Duarte, 2009. The effects of training on performance in service companies: A data panel study. *International Journal of Manpower* 30(4), 393-407.
- Dimba, K. B., 2010. Strategic human resource management practices: Effect on performance. *African Journal of Economic and Management Studies* 1(2), 128-137.
- Farooq, M., and M. A. Khan, 2011. Impact of training and feedback on employee performance. *Far East Journal of Psychology and Business* 5(1), 23-33.
- Gauld, D., and P. Miller, 2004. The qualifications and competencies held by effective workplace trainers. *Journal of European Industrial Training* 28(1), 8-22.
- Gautam, D. K., 2013. Employees' commitment and organizational performance in Nepal: A typological framework. *Banking Journal* 3(2), 1-20.
- Girdwichai, L., and C. Sriviboon, 2020. Employee motivation and performance: Do the work environment and the training matter? *Journal of Security and Sustainability Issues* 9(4), 42-53.
- Imran, M., and A. Tanveer, 2015. Impact of training and development on employees' performance in banks of Pakistan. *European Journal of Training and Development Studies* 3(1), 22-44.
- Karim, M. M., M. M. Choudhury, and W. B. Latif, 2019. The impact of training and development on employees' performance: an analysis of quantitative data. *Noble International Journal of Business and Management Research* 3(2), 25-33.
- Khan, R. A. G., F. A. Khan, and M. A. Khan, 2011. Impact of training and development on organizational performance. *Global Journal of Management and Business Research* 11(7), 63-68.
- Lim, D. H., and S. D. Johnson, 2002. Trainee perceptions of factors that influence learning transfer. *International Journal of Training and Development* 6(1), 36-48.

- Maharjan, M. P., 2013. Human resource management practices in Nepal: An empirical study on foreign and Nepali firms. *Journal of Training and Development* 1(1), 55-61.
- Molina-Castillo, F.J., A.L. Meroño-Cerdán, C. Lopez-Nicolas, and L. Fernandez-Espinar, 2023. Innovation and Technology in Hospitality Sector: Outcome and Performance. *Businesses* 3(1), 198-219.
- Mozael, B. M., 2015. Impact of training and development programs on employee performance. *International Journal of Scientific and Research Publications* 5(11), 38-42.
- Nda, M. M., and R. Y. Fard, 2013. The impact of employee training and development on employee productivity. *Global Journal of Commerce and Management Perspective* 2(6), 91-93.
- Nikandrou, I., V. Brinia, and E. Bereri, 2009. Trainee perceptions of training transfer: An empirical analysis. *Journal of European Industrial Training* 33(3), 255-270.
- Oluwaseun, O. O., 2018. Employee training and development as a model for organizational success. *International Journal of Engineering Technologies and Management* 6(10), 48-59.
- Parent-Lamarche, A., J. Dextras-Gauthier, and A.S. Julien, 2023. Toward a new model of human resource management practices: construction and validation of the High Wellbeing and Performance Work System Scale. *Frontiers in Psychology* 14(1), 115-118.
- Purwati, A. A., and H. Satria, 2017. Pengaruh Perekrutan, Motivasi, Dan Pelatihan Terhadap Kinerja Karyawan Pada CV. Skala Sport Pekanbaru. *Procuratio: Jurnal Ilmiah Manajemen* 5(4), 418-429.
- Rajasekar, J., and S. A. Khan, 2013. Training and development function in Omani public sector organizations: A critical evaluation. *The Journal of Applied Business and Economics* 14(2), 37- 52.
- Riaz, A., R. N. Idrees, and A. Imran, 2013. Employees' belief regarding training benefits and organizational commitment: A case in banking sector of Pakistan. *Middle-East Journal of Scientific Research* 16(3), 310-318.
- Shafiq, S., and S. M. Hamza, 2017. The effect of training and development on employee performance in private company, Malaysia. *International Journal of Education, Learning and Training* 2(2), 42-56.
- Shaheen, A., S. Naqvi, and M. Khan, 2013. Employees training and organizational performance: Meditation by employee performance. *Interdisciplinary Journal of Contemporary Business Research* 5(4), 490-503.
- Shwerani, K., and N. Mohammed, 2015. An analysis of training and employee performance: A case study in a telecommunication company in Erbil. *International Journal of Social Sciences and Educational Studies* 2(2), 74-82.
- Tannenbaum, S. I., and G. Yukl, 1992. Training and development in work organizations. *Annual Review of Psychology* 43(8), 339-441.
- Ugbomhe, U. O., G. N. Osagie, and U. E. Egwu, 2016. Impact of training and development on employee performance in selected banks in Edo North Senatorial District, Nigeria. *Indian Journal of Commerce and Management Studies* 7(3), 48-55.
- Uma, S. N., 2013. A study on training importance for employees of their successful performance in the organization. *International Journal of Science and Research* 2(11), 137-140.
- Younas, W., M. Farooq, F. Khalil-Ur-Rehman, and A. Zreen, 2018. The impact of training and development on employee performance. *IOSR Journal of Business and Management* 20(7) 20-23.
- Zuana, C. I., B. Swasto, and Susilo, H., 2014. Pengaruh pelatihan kerja dan lingkungan kerja karyawan terhadap prestasi kerja karyawan. *Jurnal Administrasi Bisnis* 7(1), 1-9.

Chapter 30

Firm Specific and Macro Economic Determinants of Stability in Nepalese Commercial Banks

Mahesh Joshi*

Abstract

This study examines the impact of firm specific and macro-economic determinants of stability in Nepalese commercial banks. Z-score and non-performing loans are the selected dependent variables. The selected independent variables are capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate. 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 Banking and Financial Statistics published by Nepal Rastra Bank and annual report of respective commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of firm specific and macro-economic determinants on the stability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a negative effect on Z-score. It means that increase in CAR leads to decrease in Z-score and non-performing loan. Furthermore, the result also showed that bank size has a positive effect on Z-score and non-performing loan. It indicates that increase in bank size leads to increase in Z-score and non-performing loan. Likewise, the study also showed that return on assets has a negative effect on Z-score. It shows that higher the return on assets, lower would be the Z-score. In contrast, the result also shows that loan to deposit ratio has a negative effect on Z-score. It means that increase in loan to deposit ratio leads to decrease in Z-score. Similarly, the result also shows that gross domestic product has a positive effect on Z-score. It means that increase in gross domestic product leads to increase in Z-score. In addition, inflation has a negative effect on Z-score. It indicates that increase in inflation leads to decrease in Z-score.

Keywords: non-performing loan, capital adequacy ratio, Z-score, bank size, return on assets, loan to deposit ratio, gross domestic product, inflation rate

1. Introduction

Bank stability refers to a situation in which the financial intermediation process runs smoothly, resulting in user confidence. Financial intermediation is the process by which banks and other financial institutions facilitate the flow of funds from savers to borrowers. Stable banks are critical for the overall stability of the financial system and the economy. In other words, financial stability refers to the smooth operation of a system of financial intermediation processes between households, firms and the government which is facilitated by a variety of financial institutions and infrastructure. The stability of financial system in an economy is a crucial catalyst for economic growth (Swamy, 2014). The stability of a financial system is crucial for the smooth functioning of an economy. It can be influenced by a multitude of factors, which can be broadly categorized into economic, regulatory, institutional, and external factors. The stability of a financial system is crucial for the smooth functioning of an economy. It can be influenced by a multitude of factors, which can be broadly categorized into economic, regulatory, institutional, and external factors. The financial health of banks and other financial institutions is critical. Well-capitalized and well-managed banks are less likely to fail and cause systemic problems. The stability of a financial system is multi-faceted and influenced by a combination of domestic and

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

international, economic and non-economic factors (Azam, 2018). Financial institutions, particularly banks, act as intermediaries between savers and borrowers. By efficiently channeling funds from savers to businesses and individuals who need capital, they facilitate investments in productive activities. A stable financial system ensures that businesses and consumers have access to credit. This access is critical for entrepreneurship, innovation, and consumption, all of which drive economic growth. The stability of the financial system is fundamental to sustaining economic growth. By ensuring efficient resource allocation, promoting investment, supporting economic activity, mitigating economic shocks, enhancing productivity, and preventing financial crises, a stable financial system creates a conducive environment for sustainable economic development. Capital adequacy is considered as capital that can effectively prevent banking industry failures by absorbing losses. Amalia (2021) analyzed the bank's performance in terms of the risk profile, income, and capital aspects of all banks in Indonesia over the period of 2015 to 2019. The study showed that capital adequacy ratio has a significant and positive effect on profitability. Matey (2021) investigated the bank liquidity risk and bank credit risk. The result concluded that bank capital ratio has a statistically positive relationship was established with bank stability. Teshome *et al.* (2018) assessed the financial performance of private commercial banks of Ethiopia. The study concluded that capital adequacy ratio, credit interest income, and size of the bank have significant positive impact on financial performance.

Bank stability is indeed a critical concern for various stakeholders, including regulators, bank supervisors, investors, and the general public. Stability in the banking sector is essential for the overall health of the financial system and the economy. Regulators and bank supervisors aim to maintain stability to protect the interests of depositors and maintain the integrity of the financial system. They implement policies and monitor banks to ensure compliance with regulatory standards. Sustainable profitability ensures that banks can build up their capital base and absorb losses. Diaconu and Oanea (2014) assessed whether there is difference in the determinants of bank stability for commercial and cooperative banks. The study found that GDP and interbank offering rate have significant positive impact on bank stability for cooperative banks. The study found no evidence of the significant relationship of any variables on bank stability for commercial banks. Similarly, Karim (2016) investigated the effect of macro-economic variables including GDP, interest rate and inflation rate on bank stability (Z-score). The study concluded that there is a significant relationship between macro-economic variables and bank stability for commercial banks and overall banking industry of Indonesia. However, for the Islamic banks, the study found no evidence of relationship between Z-score and macro-economic variables. Improvement in GDP strengthen bank's performance and stability (Kosmidou, 2008). On the other side, Tan and Floros (2012) found a negative relationship between GDP growth and bank performance. The study also suggested that the performance of banks is inflated due to the increase in GDP growth, which in turn decreases bank stability. The possible argument is that business environment improves, when GDP growth increases, which further declines entry barriers for new banks. This allows competition in the financial markets and hence lowers bank profitability, and by extension, reduces bank stability.

Ashraf and Sulehri (2023) examined the impact of asset quality on financial stability of Islamic Banks in Pakistan. The study found that capital adequacy ratio and loan to deposit ratio significant impact on Z-score. Moreover, the mean average value of financial ratios showed that loan to deposit ratio and capital adequacy ratio have a better impact on Z-score than the non-performing loan. Amara and Mabrouki (2019) assessed the impact of liquidity and credit risks on the bank stability. The study revealed that the return on asset has a negative but also insignificant effect on bank stability. Deltuvaite (2010) analyzed the concentration-stability relationship in the banking system. The study showed that there is a positive correlation between banking system profitability (ROA) and banking system stability and the result is also significant. Altaee *et al.* (2013) investigated the financial stability of banks in GCC countries. The study found that bank size and stability have a statistical insignificant relationship. Ali

et al. (2011) examined the role of risk and corruption on bank stability. The study showed that bank size, liquidity risk, funding risk and corruption exert a positive impact on bank stability. Additionally, the study found a negative relationship between credit risk and bank stability. Daoud and Kammoun (2020) examined the financial stability and bank capital. The result showed that bank size is negatively and significantly related to Z-score. Kiemo *et al.* (2019) investigated on bank-specific determinants of commercial banks financial stability in Kenya for the period 2000 to 2015. The study concluded that bank size, regulatory capital; bank funding and corporate governance have positive and statistically significant effect on financial stability for commercial banks.

Nasri *et al.* (2023) investigated the effect of fintech and internal factors on bank financial stability. The study concluded that loan to deposit ratio has a significant influence on financial stability in banking companies in Indonesia. Rashid and Jabeen (2016) examined the bank-specific, financial and macro-economic determinants of the performance of Islamic and conventional banks in Pakistan over the period 2006–2012. The study found that operating efficiency, overheads and reserves are significant determinants of conventional banks' performance, whereas deposits, operating efficiency, and market concentration are significant determinants of Islamic bank. Gamze (2018) assessed the financial statement analysis of Turkish banks by exploring the determinants of bank stability, as measured by non-performing loans ratio using annual data on 27 Turkish banks for the years 2007- 2015. The study concluded that return on asset, loans to asset ratio, inefficiency index, non-interest income share and loan loss provisions share have significant and positive effect on banks' stability. Moyo and Tursoy (2020) examined the impact of inflation and exchange rate on the financial performance of commercial banks in South Africa. The finding concluded that there is an inverse relationship existing between inflation and bank performance. The relationship between bank performance and inflation varies from economy to economy. This means that, if the interest rates are adjusted according to the anticipated inflation, the impact of inflation on bank profitability is positive, which in turn greater stability.

In the context of Nepal, Singh (2012) examined the bank stability and its determinants in the Nepalese banking industry. The study showed that bank size has a weak positive impact on stability. This gives the impression that bigger banks are engaging in less risk-taking and doing better credit screening than small banks. The results also revealed that inflation is a significant factor impacting the stability of the banks. It has a strong negative and statistically significant impact on bank stability. The study found that the regulatory authorities need to maintain a steady and low level of inflation in order to strengthen the stability of the banks. Neupane (2023) investigated the stability of commercial banks in Nepal. The study concluded that bank efficiency, profitability, and capital base are important internal variables, whereas banking sector development, GDP growth, inflation, and exchange rate are important external factors that influence the financial stability of Nepalese commercial banks. Furthermore, bank size, loan loss provision, and bank concentration have negligible influences on Nepalese commercial banks' financial stability.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of impact of firm specific and macro-economic determinants of bank stability. 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 firm specific and macro-economic determinants of stability in Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate with Z-score and non-performing loan 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 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 104 observations. The study employed convenience sampling method. The main sources of data include Banking and Financial Statistics published by Nepal Rastra Bank and annual report of respective 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	Rastriya Banijya Bank Limited	2015/16 to 2022/23	8
2	Agricultural Development bank Limited	2015/16 to 2022/23	8
3	Nepal Bank Limited	2015/16 to 2022/23	8
4	Everest Bank Limited	2015/16 to 2022/23	8
5	Machhapuchchhre Bank Limited	2015/16 to 2022/23	8
6	Nepal SBI Bank Limited	2015/16 to 2022/23	8
7	NIC Asia Bank Limited	2015/16 to 2022/23	8
8	NMB Bank Limited	2015/16 to 2022/23	8
9	Siddhartha Bank Limited	2015/16 to 2022/23	8
10	Citizens Bank International Limited	2015/16 to 2022/23	8
11	Prime Commercial Bank Limited	2015/16 to 2022/23	8
12	Sanima Bank Limited	2015/16 to 2022/23	8
13	Standard Chartered Bank Nepal Limited	2015/16 to 2022/23	8
Total number of observations			104

Thus, the study is based on the 104 observations.

The model

The model used in this study assumes that bank stability depends on firm specific and macro-economic determinants. The dependent variables selected for the study are Z-score return on assets and non-performing loan. Similarly, the selected independent variables in this study are capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate. Therefore, the models take the following forms:

$$\text{Z-score} = \beta_0 + \beta_1 \text{CAR} + \beta_2 \text{BS} + \beta_3 \text{ROA} + \beta_4 \text{LDR} + \beta_5 \text{GDP} + \beta_6 \text{INF} + e$$

$$\text{NPL} = \beta_0 + \beta_1 \text{CAR} + \beta_2 \text{BS} + \beta_3 \text{ROA} + \beta_4 \text{LDR} + \beta_5 \text{GDP} + \beta_6 \text{INF} + e$$

Where,

Z-score = Z-score return on assets as measured by the ratio of (ROA + Capital adequacy ratio) divided by standard deviation of ROA, in percentage.

NPL= Non-performing loan as measured by the ratio of non-performing loan to total gross loans, in percentage.

CAR= Capital adequacy ratio as measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage.

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

BS= Bank size as measured by the total assets of a bank, Rs. in billions.

LDR= Liquidity ratio as measured by the ratio of total loans to total deposits, in percentage.

GDP= Gross domestic product as measured by the increase in growth rate, in percentage.

INF= Annual inflation rate as measured by the consumer price index, in percentage.

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

Capital adequacy ratio

Asadi (2020) found that an increase in the capital has significantly improved banking stability. Lusy *et al.* (2018) found that capital adequacy ratio positively influences profitability. Similarly, Korbi and Bougatef (2016) concluded that regulatory capital represents the most important determinant of financial stability and it is positively associated with bank stability. Moreover, Abiodun *et al.* (2020) showed that capital adequacy ratio has a significant strong positive relationship with the profitability of the bank. Nahar *et al.* (2020) identified a positive relationship between capital adequacy ratio and financial performance. Kumar *et al.* (2020) investigated the relationship between monetary policy and bank profitability in New Zealand. The study revealed that capital adequacy ratio is positively related to profitability. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between capital adequacy ratio and bank stability.

Bank size

Kiemo *et al.* (2019) examined the bank-specific determinants of commercial banks financial stability in Kenya. The study found bank size, regulatory capital; bank funding and corporate governance have positive and statistically significant effect on financial stability of commercial banks. Based on these findings the study concluded increase in bank size, regulatory capital, bank funding and corporate governance boasted financial stability for commercial banks in Kenya. Tabak *et al.* (2012) concluded that there is a positive relationship between stability (Z-score) and bank size of Brazilian banks. Boulanouar *et al.* (2021) showed that there is a positive correlation between the size and financial stability of commercial banks. Bashir *et al.* (2021) concluded that there is positive relationship between the size and financial stability. Raouf and Ahmed (2020) showed that there is positive correlation between the size and financial stability. Minh *et al.* (2020) revealed that bank size had a positive effect on stability. Based on it, this study develops the following hypothesis:

H₂: There is positive relationship between bank size and bank stability.

Return on assets

Profitability refers to a company's ability to generate earnings relative to its expenses and other costs

incurred during a specific period. It is a key metric used to assess the financial health and performance of a business. Al-Khouri and Arouri (2016) showed that bank stability is related to profitability, financial market development, the openness of the banking system, and bank size. Le (2017) concluded that bank profitability is positively related to bank stability. A profitable banking system, on the other hand, tends to absorb financial shocks by increasing capital, thereby improving financial system stability (Athanasoglou *et al.*, 2008). Hellmann *et al.* (2000) revealed that there is a positive relationship between profitability and bank stability. Fu *et al.* (2016) concluded that bank stability is positively related to loan growth and adversely related to profitability for small banks. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between return on assets and bank stability.

Loan to deposit ratio

Loan to deposit ratio is a financial metric used to assess a bank's liquidity and lending practices. It compares a bank's total loans to its total deposits, indicating the proportion of deposits that a bank has lent out as loans. Ghenimi *et al.* (2017) examined the main determinants of bank stability in 49 banks of Middle East and North African (MENA) region over the period 2006-2013. The study revealed that interaction of the credit risk and liquidity risk has significant and negative impact on bank stability. Wagner (2007) revealed that an increased liquidity of bank assets, paradoxically, increases banking instability. Arif and Anees (2012) showed that increased liquidity holdings are negatively associated with financial development. Arellano and Olymia (1995) revealed that the interaction between credit and liquidity risks contribute to bank instability. Based on it, this study develops the following hypothesis:

H₄: There is negative relationship between loan to deposit ratio and bank stability.

Gross domestic product

Gross domestic product is a crucial economic indicator that measures the total monetary value of all goods and services produced within a country's borders over a specific period, typically annually or quarterly. It serves as a fundamental measure of a country's economic performance and is widely used to gauge the size and growth rate of an economy. Shijaku (2017) showed that macro-economic variable seem to have a significant effect on bank stability. Rashid *et al.* (2017) concluded the positive relationship between GDP and bank stability. Vejzagic and Zarafat (2014) revealed that there is a positive and statistically relationship between economic growth and profitability of Malaysian banks. Ali *et al.* (2011) found that asset management and GDP growth have a positive effect on profitability of Pakistan banking sector. Almazari (2014) examined the determinants of profitability of Saudi Arabia and Jordan commercial banks. The study revealed that there is a significant and positive relationship between bank profitability and gross domestic product. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between gross domestic product and bank stability.

Inflation rate

Inflation refers to the sustained increase in the general price level of goods and services in an economy over a period of time. It essentially erodes the purchasing power of money, meaning that the same amount of money will buy fewer goods and services than it did previously. Ali and Iva (2013) concluded that inflation rate has negative and significant relation with stability. Rajha (2016) found that inflation rate has negative significant effect on non-performing loan. Viphindartin *et al.* (2021) analyzed the positive and significant effect on long-term non-performing loans and inflation. Based on it, this study

develops the following hypothesis:

H_6 : There is negative relationship between inflation rate and bank stability.

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 13 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are Z-score (Z-score return on assets as measured by the ratio of (ROA + Capital adequacy ratio) divided by standard deviation of ROA, in percentage) and NPL (Non-performing loan as measured by the ratio of non-performing loan to total gross loans, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), BS (Bank size as measured by the total assets of a bank, Rs. in billions), LDR (Liquidity ratio as measured by the ratio of total loans to total deposits, in percentage), GDP (Gross domestic product as measured by the increase in growth rate, in percentage) and INF (Annual inflation rate as measured by the consumer price index, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
Z-score	18.01	65.22	39.42	12.15
NPL	0.01	4.85	1.46	1.31
CAR	10.2	22.99	14.20	2.40
BS	55.12	394.02	163.54	76.93
ROA	0.47	2.79	1.56	0.49
LDR	56.88	107.01	84.96	8.78
GDP	-2.37	8.98	4.20	3.66
INF	3.6	9.94	5.87	2.01

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 variables of 13 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are Z-score (Z-score return on assets as measured by the ratio of (ROA + Capital adequacy ratio) divided by standard deviation of ROA, in percentage) and NPL (Non-performing loan as measured by the ratio of non-performing loan to total gross loans, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), BS (Bank size as measured by the total assets of a bank, Rs. in billions), LDR (Liquidity ratio as measured by the ratio of total loans to total deposits, in percentage), GDP (Gross domestic product as measured by the increase in growth rate, in percentage) and INF (Annual inflation rate as measured by the consumer price index, in percentage).

Variables	Z-score	NPL	CAR	BS	ROA	LDR	GDP	INF
Z-score	1							
NPL	-0.454**	1						
CAR	-0.049	-0.020	1					
BS	0.051	0.322**	-0.18	1				
ROA	-0.105	0.045	0.365**	-0.520**	1			
LDR	0.079	-0.125	-0.059	0.098	-0.219*	1		
GDP	0.095	-0.106	0.158	-0.153	0.267**	0.187	1	
INF	-0.131	0.146	-0.292**	-0.016	-0.048	-0.201*	-0.654**	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 negative relationship with Z-score return on assets. It means that increase in CAR leads to decrease in Z-score (ROA). Furthermore, the result also shows that there is a positive relationship between bank size and Z-score. It indicates that increase in bank size leads to increase in Z-score. Likewise, the study also shows that return on assets has a negative relationship with Z-score. It shows that higher the return on assets, lower would be the Z-score. In contrast, the result also shows that loan to deposit ratio has a negative relationship with Z-score. It means that increase in loan to deposit ratio leads to decrease in Z-score. Similarly, the result also shows that gross domestic product has a positive relationship with Z-score. It means that increase in gross domestic product leads to increase in Z-score. In addition, inflation has a negative relationship with Z-score return on assets. It indicates that increase in inflation leads to decrease in Z-score.

Similarly, the result also shows that there is a negative relationship between capital adequacy ratio and non-performing loan. It means that increase in capital adequacy ratio leads to decrease in non-performing loan. Likewise, there is a positive relationship between bank size and non-performing loan. It indicates that increase in bank size leads to increase in non-performing loan. Moreover, the result also shows that return on assets has a positive relationship with non-performing loan. It indicates that higher the return on assets, higher would be the non-performing loan. In contrast, the result also shows that loan to deposit ratio has a negative relationship with non-performing loan. It indicates that higher the loan to deposit ratio, lower would be the non-performing loan. In addition, it also shows that gross domestic product has a negative relationship with non-performing loan. It indicates that increase in gross domestic product leads to decrease in non-performing loan. Moreover, inflation has a positive relationship with non-performing loan. It indicates that higher the inflation, higher would be the non-performing loan.

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 capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate with Z-score return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate on Z-score return on assets

The results are based on panel data of 13 commercial banks with 104 observations for the period of 2015/16-2022/23 by using the

linear regression model and the model is $Z\text{-score}_{it} = \beta_0 + \beta_1 \text{CAR}_{it} + \beta_2 \text{BS}_{it} + \beta_3 \text{ROA}_{it} + \beta_4 \text{LDR}_{it} + \beta_5 \text{GDP}_{it} + \beta_6 \text{INF}_{it} + e_{it}$ where, the dependent variable is Z-score (Z-score return on assets as measured by the ratio of (ROA + Capital adequacy ratio) divided by standard deviation of ROA, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), BS (Bank size as measured by the total assets of a bank, Rs. in billions), LDR (Liquidity ratio as measured by the ratio of total loans to total deposits, in percentage), GDP (Gross domestic product as measured by the increase in growth rate, in percentage) and INF (Annual inflation rate as measured by the consumer price index, in percentage).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		CAR	BS	ROA	LDR	GDP	INF			
1	42.911 (5.94)**	-0.246 (0.49)						0.007	12.199	0.241
2	38.10 (13.505)**		0.008 (0.515)					0.007	12.198	0.266
3	43.471 (10.907)**			-2.597 (1.066)				0.001	12.146	1.136
4	43.471 (10.907)**				0.109 (0.796)			0.004	12.176	0.633
5	38.084 (20.902)**					0.317 (0.967)		0.001	12.158	0.935
6	44.071 (11.961)**						-0.792 (1.334)	0.008	12.109	1.780
7	41.218 (5.001)**	-0.206 (0.403)	0.007 (0.433)					0.016	12.248	0.213
8	44.366 (4.892)**	-0.059 (0.109)	0.001 (0.041)	-2.553 (0.839)				0.019	12.266	0.376
9	37.007 (2.349)*	-0.107 (0.197)	0.001 (0.030)	-2.206 (0.708)	0.081 (0.572)			-0.025	12.308	0.362
10	41.023 (2.551)**	-0.107 (0.197)	0.001 (0.013)	-3.124 (0.975)	0.036 (0.246)	0.423 (1.186)		0.021	12.283	0.572
11	48.269 (2.601)**	-0.261 (0.450)	0.001 (0.077)	-2.619 (0.800)	0.029 (0.195)	0.175 (0.368)	-0.681 (0.787)	0.025	12.307	0.578

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 return on assets is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are negative with Z-score return on assets. It indicates that capital adequacy ratio has a negative impact on Z-score return on assets. This finding is inconsistent with the findings of Korbi and Bougatef (2017). Similarly, the beta coefficients of bank size are positive with Z-score. It indicates that bank size has a positive impact on Z-score return on assets. This finding is consistent with the findings of Boulanouar *et al.* (2021). Moreover, the beta coefficients for return on assets are negative with Z-score. It indicates that return on assets has a negative impact on Z-score return on assets. This finding is consistent with the findings of Al-Khoury and Arouri (2016). Likewise, the beta coefficients for loan-to-deposit ratio are positive with Z-score. It indicates that loan-to-deposit ratio has a positive impact on Z-score return on assets. This finding is consistent with the findings of Arellano and Olymia (1995). Likewise, the beta coefficients of gross domestic product are positive with Z-score return on assets. It indicates that gross domestic product has a positive impact on return on assets. This finding is similar to the findings of Shijaku (2017).

Table 5 shows the regression results of capital adequacy ratio, bank size, return on assets, loan to deposit ratio, gross domestic product and inflation rate with non-performing loan of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, bank size, return on assets, loan to deposit

ratio, gross domestic product and inflation rate on non-performing loan

The results are based on panel data of 13 commercial banks with 104 observations for the period of 2015/16-2022/23 by using the linear regression model and the model is $NPL_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 BS_{it} + \beta_3 ROA_{it} + \beta_4 LDR_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it} + e_{it}$ where, the dependent variable is NPL (NPL as measured by the non-performing loan to total gross loans, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of Tier I capital + Tier II capital to total risk weighted assets, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), BS (Bank size as measured by the total assets of a bank, Rs. in billions), LDR (Liquidity ratio as measured by the ratio of total loans to total deposits, in percentage), GDP (Gross domestic product as measured by the increase in growth rate, in percentage) and INF (Annual inflation rate as measured by the consumer price index, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	BS	ROA	LDR	GDP	INF			
1	1.617 (2.072)*	-0.011 (0.201)						0.009	1.318	0.041
2	0.565 (1.959)*		0.005 (3.431)**					0.095	1.248	11.774
3	1.273 (2.946)**			0.121 (0.461)				0.008	1.317	0.211
4	3.045 (2.430)*				-0.019 (1.270)			0.006	1.308	1.613
5	1.621 (8.256)**					-0.038 (1.072)		0.001	1.311	1.150
6	1.621 (8.256)**						0.096 (1.494)	0.012	1.304	2.232
7	0.241 (0.286)	-0.021 (0.410)	0.006 (3.435)**					0.087	1.253	5.923
8	-0.778 (0.866)	-0.025 (0.461)	0.008 (4.437)**	0.826 (2.741)**				0.143	1.214	6.708
9	0.734 (0.473)	-0.025 (0.461)	0.008 (4.422)**	0.828 (2.618)**	-0.017 (1.194)			0.146	1.212	5.409
10	0.415 (0.261)	-0.021 (0.399)	0.008 (4.406)**	0.828 (2.618)**	-0.013 (0.905)	-0.034 (0.955)		0.145	1.212	4.505
11	-0.704 (0.386)	-0.002 (0.039)	0.008 (4.504)**	0.750 (2.332)*	-0.012 (0.827)	-0.005 (0.099)	0.105 (1.238)	0.150	1.209	4.030

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 capital adequacy ratio are negative with non-performing loan. It indicates that capital adequacy ratio has a negative impact on non-performing loan. This finding is similar to the findings of Kumar *et al.* (2020). Similarly, the beta coefficients of bank size are positive with non-performing loan. It indicates that bank size has a positive impact on non-performing loan. This finding is consistent with the findings of Tabak *et al.* (2012). Likewise, the beta coefficients of return on assets are positive with non-performing loan. It indicates that return on assets has a positive impact on non-performing loan. This finding is consistent with the findings of Le (2017). Similarly, the beta coefficients of loan to deposit ratio are negative with non-performing loan. It indicates that loan to deposit ratio has a negative impact on non-performing loan. This finding is consistent with the findings of Ghenimi *et al.* (2017). Likewise, the beta coefficients of gross domestic product are negative with non-performing loan. It indicates that gross domestic product has a negative impact on non-performing loan. This finding is consistent with the findings of Vejzagic and Zarafat (2014).

4. Summary and conclusion

Firm specific and macro-economic determinants significantly impact the profitability of a

financial institution or any business that deals with financial instruments. Firm specific and macro-economic determinants all pose significant challenges to the profitability and stability of financial institutions. Effective risk management practices, including diversification, hedging, and stringent credit assessment, are crucial for mitigating these risks and ensuring sustainable stability.

This study attempts to analyze the impact of firm specific and macro-economic factors on the stability of Nepalese commercial banks. 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 major conclusion of this study is that capital adequacy ratio, return on assets, and inflation rate have negative effect on Z-score of Nepalese commercial banks. However, bank size, loan to deposit ratio and gross domestic product have positive effect on Z-score. The study also showed that capital adequacy ratio, loan to deposit ratio and gross domestic product have negative effect on non-performing loan of Nepalese commercial banks. However, bank size, return on assets, and inflation rate have positive effect on non-performing loan. The study also concluded that bank size and return on assets are the most influencing factor that determines the changes in the non-performing loan of Nepalese commercial banks.

References

- Abiodun, S. W., A. A. Abdul-Azeez, and Y. L. Adewale, 2020. Determinants of capital adequacy of Nigerian banks. *Market Forces* 15(1), 1-15.
- Ali, K., M. F. Akhtar, and H. Z. Ahmed, 2011. Bank-specific and macroeconomic indicators of profitability: Empirical evidence from the commercial banks of Pakistan. *International Journal of Business and Social Science* 2(6), 235-242.
- Ali, S., and S. Iva, 2013. Impact of bank specific variables on the non-performing loans ratio in Albanian banking system. *Journal of Finance and Accounting* 4(7), 148-52.
- Al-Khouri, R., and H. Arouri, 2016. The simultaneous estimation of credit growth, valuation, and stability of the Gulf cooperation council banking industry. *Economic Systems* 40(3), 499-518.
- Almazari, A. A., 2014. Impact of internal factors on bank profitability: Comparative study between Saudi Arabia and Jordan. *Journal of Applied Finance and Banking* 4(1), 125-140.
- Altaee, H. H. A., I. M. A. Talo, and M. H. M. Adam, 2013. Testing the financial stability of banks in GCC countries: Pre and post financial crisis. *International Journal of Business and Social Research* 3(4), 93-105.
- Amalia, S., 2021. The impact of financial ratio indicators on banking profitability in Indonesia. *Turkish Journal of Computer and Mathematics Education* 12(8), 580-588.
- Amara, T., and M. Mabrouki, 2019. The impact of liquidity and credit risks on the bank stability. *Journal of Smart Economic Growth* 4(2), 97-116.
- Arellano, M., and B. Olymia, 1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics* 68(1), 29-51.
- Arif, A., and A. N. Anees, 2012. Liquidity risk and performance of banking system. *Journal of Financial Regulation and Compliance* 20(2), 182-195.
- Asadi, Z., K. Yavari, and H. Heydari, 2020. The study of the effects of liquidity and credit risk on bank stability in Iran using the Z-score index. *The Journal of Economic Policy* 12(23), 1-31.
- Ashraf, M. S., and F. A. Sulehri, 2023. Impact of asset quality on financial stability of Islamic Banks in Pakistan: A moderating role of corporate image. *Bulletin of Business and Economics* 12(3), 268-277.

- 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.
- Azam, S., 2018. Financial comparison of developed and emerging countries banks. *International Journal of Scientific and Technology Research* 7(9), 35–41.
- Bashir, U., S. Khan, A. Jones, and M. Hussain, 2021. Do banking system transparency and market structure affect financial stability of Chinese banks? *Economic Change and Restructuring* 54(1), 1–41.
- Boulanouar, Z., F. Alqahtani, and B. Hamdi, 2021. Bank ownership, institutional quality and financial stability: Evidence from the GCC region. *Pacific Basin Finance Journal* 66(1), 101–115.
- Daoud, Y., and A. Kammoun, 2020. Financial stability and bank capital: The case of Islamic Banks. *International Journal of Economics and Financial Issues* 10(5), 361–369.
- Deltuvaite, V., 2010. The concentration-stability relationship in the banking system: An Empirical Research. *Economics and Management* 15(1), 900–909.
- Diaconu, R. I., and D. C. Oanea, 2014. The main determinants of bank's stability. Evidence from Romanian banking sector. *Procedia Economics and Finance* 16(1), 329–335.
- Fu, X., Lin, Y., and P. Molyneux, 2016. Bank capital and liquidity creation in Asia Pacific. *Economic Inquiry* 54(2), 966–993.
- Gamze, O. D., 2018. Determinants of bank stability: A financial statement analysis of Turkish Banks. *Socioeconomic Journal* 26(38), 87–103.
- Ghenimi, A., H. Chaibi, and M. A. B. Omri, 2017. The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region. *Borsa Istanbul Review* 17(4), 238–248.
- Hellmann, T. F., K. C. Murdock, and J. E. Stiglitz, 2000. Liberalization, moral hazard in banking, and prudential regulation: Are capital requirements enough? *American Economic Review* 90(1), 147–165.
- Karim, N. A., 2016. Macroeconomic indicators and bank stability: A case of banking in Indonesia. *Buletin Ekonomi Moneter dan Perbankan* 18(4), 431–448.
- 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.
- Korbi, F., and K. Bougatef, 2017. Regulatory capital and stability of Islamic and conventional banks. *International Journal of Islamic and Middle Eastern Finance and Management* 10(3), 312–330.
- Kosmidou, K., 2008. The determinants of banks' profits in Greece during the period of EU financial integration. *Managerial Finance* 34(1), 146–159.
- 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), 35–52.
- Le, T. D., 2017. The interrelationship between net interest margin and non-interest income: Evidence from Vietnam. *International Journal of Managerial Finance* 13(5), 521–540.
- Lusy, L., Y. B. Hermanto, T. W. Panjaitan, and 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.
- Matey, J., 2021. Bank liquidity risk and bank credit risk: implication on bank stability in Ghana. *International Journal of Scientific Research in Multidisciplinary Studies*, 7(4), 01–09.

- Minh, S., V. Hong, L. Hoang, and T. Thuy, 2020. Does banking market power matter on financial stability? *Management Science Letters*, 10(2), 343-350.
- Moyo, D., and T. Tursoy, 2020. Impact of inflation and exchange rate on the financial performance of commercial banks in South Africa. *Journal of Applied Economic Sciences* 15(3), 45-58.
- Nahar, F. H., C. Faza, and M. Azizurrohman, 2020. Macroeconomic analysis and financial ratios on Sharia commercial bank profitability: A case study of Indonesia. *Journal of Islamic Economics, Finance, and Banking* 3(1), 37-50.
- Nasri, K., T. Clarette, H. S. Lestari, and F. M. Leon, 2023. The effect of fintech and internal factors on bank financial stability. *Global Research Review in Business and Economics* 9(1), 31-38.
- Neupane, B. P., 2023. Stability of commercial banks in Nepal. *International Journal of Scientific Research in Engineering and Management* 7(9), 1-21.
- Rajha, K. S., 2016. Determinants of non-performing loans: Evidence from the Jordanian banking sector. *Journal of Finance and Bank Management* 4(1), 125-136.
- Raouf, H., and H. Ahmed, 2020. Risk governance and financial stability: A comparative study of conventional and Islamic banks in the GCC. *Global Finance Journal* 6(1), 100-115.
- Rashid, A., and S. Jabeen, 2016. Analyzing performance determinants: Conventional versus Islamic banks in Pakistan. *Borsa Istanbul Review* 16(2), 92-107.
- Shijaku, G., 2017. Does concentration matter for bank stability? Evidence from the Albanian banking sector. *Journal of Central Banking Theory and Practice* 6(3), 67-94.
- Singh, N. (2012). Bank stability and its determinants in the Nepalese banking industry. *NRB Economic Review* 33(2), 15-48.
- Swamy, V., (2014). Testing the interrelatedness of banking stability measures. *Journal of Financial Economic Policy* 6(1), 25-45.
- Tabak, B.M., D. M. Fazio, and D. O. Cajueiro, 2012. The relationship between banking market competition and risk-taking: Do size and capitalization matter? *Journal of Banking and Finance* 36(12), 3366-3381.
- Tan, Y., and Floros, C. (2012). Bank profitability and GDP growth in China: A note. *Journal of Chinese Economic and Business Studies* 10(2), 267-273.
- Teshome, E., K. Debela, and M. Sultan, 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.
- Vejzagic, M., and H. Zarafat, 2014. An analysis of macroeconomic determinants of commercial banks profitability in Malaysia for the period 1995-2011. *Journal of Asian Economy and Financial Review* 4(1), 41-57.
- Viphindartin, S., M. Ardhanari, R. N. Wilantari, R. P. Somaji, and S. Arianti, 2021. Effects of bank macroeconomic indicators on the stability of the financial system in Indonesia. *Journal of Bank Management* 8(1), 647-654.
- Wagner, J., 2007. Exports and productivity: A survey of the evidence from firm-level data. *World Economy* 30(1), 60-82.

Chapter 31

Impact of Macroeconomic Variables on Stock Returns in Nepalese Insurance Companies

Raman Silwal and Dr. Nar Bahadur Bista*

Abstract

This study examines the impact of macro-economic variables on the stock returns in the context of Nepalese insurance companies. Price to earnings ratio and capital gain yield are the selected dependent variables. The selected independent variables are inflation, gross domestic products, interbank rate, money supply, per capita income and remittance. The study is based on secondary data gathered from 13 insurance companies of Nepal for the study period from 2013/14 to 2021/22, leading to a total of 117 observations. The main sources of data include current macroeconomic and financial situation, monetary policy published by Nepal Rastra Bank and Nepal Stock Exchange and annual audited financial statements and websites of respective insurance companies. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic variables on the stock returns of the Nepalese insurance companies.

The study showed that gross domestic products have a negative effect on price to earnings ratio and capital gain yield. It indicates that higher the gross domestic products, lower would be the price to earnings ratio and capital gain yield. Similarly, inflation has a positive effect on price to earnings ratio and capital gain yield. It indicates that higher the inflation rate, higher would be the price to earnings ratio and capital gain yield. Likewise, broad money has a negative effect on price to earnings ratio and capital gain yield. It indicates that increase in broad money supply leads to decrease in price to earnings ratio and capital gain yield. Moreover, interbank rate has a negative effect on price to earnings ratio and capital gain yield. It indicates that higher the inter-bank rate, lower would be the price to earnings ratio and capital gain yield. Likewise, per capita income has a negative effect on price to earnings ratio and capital gain yield. It indicates that higher the per capita income, lower would be the price to earnings ratio and capital gain yield. Furthermore, remittance has a negative effect on price to earnings ratio and capital gain yield. It indicates that increase in remittance leads to decrease in price to earnings ratio and capital gain yield.

Keywords: inflation, gross domestic products, interbank rate, money supply, per capita income, remittance

1. Introduction

Stock markets play an important role in national economies, as they are considered to be very helpful in channeling and diversifying the domestic savings and foreign capital into productive investment, fostering capital formation and sustaining economic growth and development (EI Nader and Alraimony, 2012). Stock markets play a crucial role in price discovery, where the prices of securities are determined through supply and demand dynamics. This mechanism helps reflect the true value of companies based on their performance and prospects, guiding investors in making informed decisions. Stock markets offer a variety of investment options, allowing investors to diversify their portfolios and spread risk. Diversification reduces the potential negative impact of poor performance in any single investment. Stock markets are fundamental to the economic infrastructure of a country. They enable the efficient allocation of resources, support capital formation, and promote economic growth and development by providing a platform for investment, risk diversification, and corporate governance.

* Mr. Silwal is a Freelance Researcher, Kathmandu, Nepal and Dr. Bista is the Principal, Uniglobe College (Pokhara University Affiliate), Kathamandu, Nepal.

The benefits they bring are instrumental in sustaining long-term economic stability and prosperity (Qing and Kusairi, 2019).

Garnia *et al.* (2022) determined the impact of macroeconomic factors, namely the price of gold, the gross domestic product (GDP) and the money supply, on stock returns in the property sector listed on the Indonesian Stock Exchange. The results of the t-test results, partially the gold price has a positive impact on stock returns in the property sector in 2013-2019. Partially, the gross domestic product has no impact on stock returns in the property sector in 2013-2019, while the money supply has a negative impact on stock returns in the property sector. Based on the results of the F test, the price of gold, gross domestic product, and the money supply simultaneously affect stock returns. Abbas *et al.* (2015) examined the impact of macroeconomic variables on stock returns for the period 2002 to 2012. Inflation, exchange rate, GDP, gold prices and T-bill's rate were taken as independent variables and KSE-100 index was taken as dependent variable. The results showed that stock return was negatively correlated to GDP, gold prices, Inflation, exchange rate and T-bill. The results also showed that GDP has insignificant negative relation with Stock Return. Inflation has significant negative relation with stock market return. T-Bill has insignificant negative relationship with stock market. El-Nader and Alraimony (2012) investigated the impact of macroeconomic factor on Amman stock market returns employing monthly data between 1991 and 2010. Autoregressive Conditional Heteroskedasticity (ARCH)/ Generalized Autoregressive Conditional Heteroskedasticity (GARCH) and OLS model was used to analyze the data. The results of the ARCH estimation confirmed that real money supply, inflation, real exchange rate and change in nominal interest rates have a negative role on the ASE returns, whereas the increase in the economic activities (RGDP) has a positive role on ASE return.

Okech and Mugambi (2016) explored the impact of macroeconomic variables on stock returns of listed banks in the Nairobi Securities Exchange (NSE). The results showed that interest rate, exchange rate and inflation have significant impact on bank stock return, while GDP had an insignificant impact at 5% level of significance. Reddy (2012) examined the impact of inflation and GDP on stock market returns in India for the period 1997-2009. The study also examined the relationship between stock market returns with respect to inflation, GDP and interest rates. A regression analysis showed that the explanatory variables accounted for 95.6 percent of the variation in stock prices. The study concluded that a reduction in interest and inflation rate resulted in increased stock prices, increased RGDP has a positive impact. Singh *et al.* (2011) examined the impact of macroeconomic factors on stock returns. The study also examined the cause-and-effect relationship of GDP, employment rate, exchange rate, inflation, money supply with stock returns in Taiwan. Empirical findings revealed that exchange rate and GDP seem to affect all of the portfolio returns, except the PBR portfolio of small companies. The study also observed that exchange rate and GDP have significant effect on the returns of companies listed in Taiwan 50 Index while inflation rate has significant effect only for PBR portfolios of small companies. On the other hand, employment rate and money supply do not appear to have any significant effect on stock returns.

Ibukun *et al.* (2021) investigated the impact of the money supply and exchange rate on Nigerian stock market performance in the short and long run, as well as the volatility issue. The findings revealed that the money supply had a long-run effect on stock market performance. The money supply has a positive effect on stock market performance in the short run. The results also showed that there is a significant relationship between the money supply and the performance of the stock market in Nigeria. In the short term, the exchange rate has a negative impact on the performance of the stock market, indicating that the relationship between the exchange rate and the performance of the stock market in Nigeria is not significant. Qing and Kusairi (2019) analyzed the effect of money supply, exchange rate, and interest spread toward the performance of stock market in Malaysia. The study

found that the money supply, real effective exchange rate and interest spread have a long-run effect on the performance of the stock market. Money supply and the real effective exchange rate have a positive effect on the stock market performance in the short run. Conversely, the interest spread has a negative influent on the stock market performance in the short run.

Widyastuti *et al.* (2017) analysed the total money supply impact, stock trading volume, inflation, interest rate and rupiah exchange rate of change of JCI (Composite Stock Price Index) in Indonesia Stock Exchange. The study found that the amount of money supply and trading volume have a significant positive impact on changes in JCI. Inflation has no impact on JCI changes. Interest rates have a significant positive impact on JCI changes. While the exchange rate has a significant negative impact on JCI changes. Haque (2016) investigated the long-run relationship and the short-run dynamics between Bangladesh stock market index (DSE General Index) and some selected macroeconomic variables such as Broad money supply (M2) and Deposit Interest rate (DIR). Cointegration analysis, along with the VECM showed that deposit interest rate is negatively related to stock prices, and money supply (M2) is positively related to stock prices in the long-run. Mahzabeen (2016) explored the impact of money supply, interest rate and inflation on Dhaka Stock Exchange (DSE) of Bangladesh. The results indicated that only interest rate had a relationship with the stock returns and could affect stock returns negatively. Other than that, money supply and inflation did not have any significant impact on percentage change in index. Rahman (2008) assessed the long-run and short-run dynamic effects of broad money supply (M2) and oil price on U.S. stock market. The estimates of vector error-correction models show that broad money supply (M2) and oil price unleash no long-run converging causal effects on U.S. stock market. Menike (2006) investigated the effects of macroeconomic variables on stock prices in emerging Sri Lankan stock market using monthly data for the period from September 1991 to December 2002. The empirical evidence found that current money supply reacts mainly positively to stock prices while the current exchange rate impacts predominantly negatively to stock prices in the banking sector.

In the context of Nepal, Shrestha (2019) investigated the relationship between selected macroeconomic variables and the stock market of price of Nepalese insurance companies listed on Nepal Stock Exchange for the period of July 2003 to June 2018. The study concluded that there exists long-run equilibrium among the macroeconomic variables and stock market of price of Nepalese insurance companies listed on Nepal Stock Exchange. Gautam and Bista (2019) examined the factors affecting the share price of Nepalese non-life insurance companies. The study found that firm size is positively related to market price of share and price earnings ratio. It indicates that larger firm size leads to increase in market price of share and price earnings ratio. However, the study shows that inflation is negatively related to market price of share and price earnings ratio. The study also shows that dividend per share and return on assets are negatively related to the market price of share and price earnings ratio. Similarly, earnings per share have negative relationship with market price of share and price earnings ratio. The study concludes that the increase in return on assets and earnings per shares do not explain the variation in stock price in Nepalese non-life insurance companies. Poudel (2019) examined the effect of firm's characteristics and macroeconomic variables on common stock return from the firms listed in Nepal Stock Exchange (NEPSE). The study found a significant negative impact of firm size, book to market equity, earning yield, and cash flow yield on stock return in Nepalese context. Among the macroeconomic variables, GDP growth rate, and interest rate have significant negative impact on stock return. Contrarily, only the rate of inflation has significant positive impact on stock return in the context of Nepal. No significant effect of money supply is observed on common stock return in the context of Nepal. Thapa (2019) explored the influencing factors of stock price in Nepal (with reference to Nepalese commercial banks) listed on the Nepal Stock Exchange Ltd. over the period of 2008 to 2018. The study revealed that earning per share (EPS), dividend per share (DPS), effective

rules and regulations, market whims and rumors, company profiles and success depend upon luck have the significant positive association with share price while interest rate (IR) and price to earnings ratio (PER), showed the significant inverse association with share price.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of macro-economic variables on the stock returns. 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 effect of macro-economic variables on the stock returns in the context of Nepalese insurance companies. Specifically, it examines the relationship of inflation, gross domestic products, interbank rate, money supply, per capita income and remittance with price to earnings ratio and capital gain yield 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 gathered from 13 insurance companies of Nepal for the study period from 2013/14 to 2021/22, leading to a total of 117 observations. The main sources of data include current macroeconomic and financial situation, monetary policy published by Nepal Rastra Bank and Nepal Stock Exchange and annual audited financial statements and websites of respective 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.

Table 1

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

SN	Name of Insurance Companies	Study period	Observation
1	Asian life Insurance Company Limited (ALICL)	2013/14-2021/22	9
2	Himalayan General Insurance Company Limited (HGI)	2013/14-2021/22	9
3	IME General Insurance Company Limited (IGI)	2013/14-2021/22	9
4	Lumbini General Insurance Company Limited (LGI)	2013/14-2021/22	9
5	Neco Insurance Company Limited (NIL)	2013/14-2021/22	9
6	Nepal Life Insurance Company Limited (NLIC)	2013/14-2021/22	9
7	Shikhar Insurance Company Limited (SICL)	2013/14-2021/22	9
8	Life Insurance Company Nepal (LICN)	2013/14-2021/22	9
9	National Life Insurance Company Limited (NLICL)	2013/14-2021/22	9
10	NLG Insurance Company Limited (NLG)	2014/15-2022/23	9
11	Prabhu Insurance Company Limited (PRIN)	2013/14-2021/22	9
12	Prudential Insurance Company Limited (PICL)	2014/15-2022/23	9
13	Siddhartha Insurance Company Limited (SIL)	2013/14-2021/22	9
Total number of observations			117

Thus, the study is based on 117 observations.

The model

The model used in this study assumes that stock market returns depend on macroeconomic variables. The dependent variables selected for the study are price to earnings ratio and capital gain yield. Similarly, the selected independent variables in this study are gross domestic products, interbank rate, broad money, per capita income, inflation and remittance. Therefore, the models take the following forms:

$$\text{PE Ratio} = \beta_0 + \beta_1 \text{GDP} + \beta_2 \text{INF} + \beta_3 \text{M2} + \beta_4 \text{IBR} + \beta_5 \text{PCI} + \beta_6 \text{REM} + e_{it}$$

$$\text{CGY} = \beta_0 + \beta_1 \text{GDP} + \beta_2 \text{INF} + \beta_3 \text{M2} + \beta_4 \text{IBR} + \beta_5 \text{PCI} + \beta_6 \text{REM} + e_{it}$$

Where,

PE Ratio = Price to earnings ratio as measured by the ratio of market price of stock to earning per share, in times.

CGY = Capital gain yield as measured by the ratio of change in price of stock to previous year stock price, in percentage.

GDP = Gross Domestic Product of the country, Rs. in billion.

INF = Inflation as measured by change in the consumer price index, in percentage.

M2 = Broad money supply, Rs. in billion.

IBR = Interbank rate, in percentage.

PCI = Per Capita GNI, in Rs.

REM = Remittance, Rs. in billion.

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

Gross domestic product

A growing economy tends to boost corporate profits, which in turn can lead to higher stock prices. A growing GDP can boost investor confidence, as it signals a healthy economic environment (Menike, 2006). Reddy (2012) examined the impact of inflation and GDP on stock market returns in India for the period 1997-2009. The study concluded that a reduction in interest and inflation rate resulted in increased stock prices, increased RGDP has a positive impact. Singh *et al.* (2011) examined the impact of macroeconomic factors on stock returns in Taiwan. The study found that exchange rate and GDP have positive effect on the returns of companies listed in Taiwan 50 Index. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between the gross domestic products and stock returns.

Broad money

Ibukun *et al.* (2021) investigated the impact of the money supply and exchange rate on Nigerian stock market performance in the short and long run, as well as the volatility issue. The study showed that there is a significant relationship between the money supply and the performance of the stock market in Nigeria. An increase in the money supply typically means there is more liquidity available in the financial system. More liquidity can lead to lower interest rates, making borrowing cheaper for

consumers and businesses. With more money available, investors are likely to allocate some of this capital to the stock market, driving up stock prices. Qing and Kusairi (2019) revealed that money supply and the real effective exchange rate have a positive effect on the stock market performance in the short run. Menike (2006) showed a positive effect of money supply on stock prices in emerging Sri Lankan stock market using monthly data for the period from September 1991 to December 2002. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between the broad money and stock return.

Interbank rate

The interbank rate is the rate of interest charged on short-term loans between banks. Banks borrow and lend money in the interbank lending market in order to manage liquidity and satisfy regulations such as reserve requirements. Gu *et al.* (2022) examined the time varying influence of interest rates on stock returns in China. The study found that on average, China stock market returns are significantly negatively correlated to interest rates, following a time-varying dynamic pattern. Batool (2021) analyzed the impact of interest rate on stock return in Pakistan stock exchange. The study attempted to trigger the connection between interest rates (Pakistan inter-bank offer rate) of different maturities and the stock index. The study found that there is a highly significant correlation between interbank rate and stock return. Ali and Moqet (2019) examined the fundamental association among rates of interest and stock prices by utilizing the data taken on a monthly basis. The findings of the study indicated that interest rate is negatively but significantly associated with stock prices. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between the interbank rate and stock returns.

Per capita income

Kartikaningsih *et al.* (2023) examined the moderation of per capita income on macroeconomic effect on stock return. The study uses macroeconomic data, per capita income, and stock returns in Indonesia during 1998-2020. The results of the study showed that with moderation of per capita income, there is an increase in the effect of macroeconomics factors on stock returns. Senturk *et al.* (2014) examined the relationship between economic growth as per capita income and stock returns. The causality relationship between stock returns and economic growth in Turkey. The study concluded that per capita income causes stock return in medium term. Applying co-integration and error correction modeling to stock market performance and per capital income time series data, Oluwatoyin and Ocheja (2009) concluded that market capitalization and per capita earnings ratio have positive association with per capita income in the long run and were found to be statistically significant. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between per capita income and stock returns.

Inflation

Giri and Joshi (2017) analyzed the long run and the short run relationship between stock price and a set of macroeconomic variables for Indian economy using annual data from 1979 to 2014. The study revealed that there is a positive influence of economic growth, inflation and exchange rate on stock prices. In addition, Mawardi *et al.* (2019) investigated the influence of macroeconomic variables on stock return in the context of Indonesia Islamic Stock Index. The result showed that the inflation rate and industrial production index have a positive impact on stock price. Abdullahi (2020) examined the effect of unstable macroeconomic indicators on banking sector stock price behavior in Nigeria stock

exchange from 2008 to 2018. The study found that there is a positive influence of inflation rate on banking sector stock price both in short and long runs in Nigerian stock market. Based on it, this study develops the following hypothesis:

H_5 : There is a positive relationship between the inflation and stock returns.

Remittance

Osoro (2020) examined the effect of diaspora remittances on stock market development at Nairobi Securities Exchange, Kenya. The study found a significant positive effect of diaspora remittances on stock market development. Chowdhury (2019) aimed to measure the impact of selective macro-economic factors on volatility in Chittagong stock exchange. The study concluded that inflation, money supply, and flow of remittance have significant positive impact on the stock return volatility. Ali (2011) investigated the impact of macroeconomic variability on stock market volatility in Bangladesh. The findings of the study showed that increased volatility in consumer price index, treasury bill rates, and inflow in foreign remittance increases the stock return volatility. Based on it, this study develops the following hypothesis:

H_6 : There is a positive relationship between remittance 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 2012/13 to 2021/22.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 13 Nepalese insurance companies for the study period from 2012/13 to 2021/22. The dependent variables are PE Ratio (Price to earnings ratio as measured by the ratio of market price of stock to earning per share, in times) and CGY (Capital gain yield as measured by the ratio of change in price of stock to previous year stock price, in percentage). The independent variables are GDP (Gross Domestic Product of the country, Rs. in billion), INF (Inflation as measured by change in the consumer price index, in percentage), M2 (Broad money supply, Rs. in billion), IBR (Interbank rate, in percentage), PCI (Per Capita GNI, in Rs.), REM (Remittance, Rs. in billion).

Variables	Minimum	Maximum	Mean	Std. Deviation
PE Ratio	-278.0	257.8	42.1	56.9
CGY	-69.4	1045.7	58.0	185.8
GDP	1791.1	2576.3	2154.7	250.7
INF	3.6	9.9	6.1	2.1
M2	1566.0	6130.5	3370.9	1346.8
IBR	0.2	7.1	2.7	1.5
PCI	82128.6	184140.3	123076.0	28598.4
REM	543.3	1220.6	785.5	155.1

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 13 Nepalese insurance companies for the study period from 2012/13 to 2021/22. The dependent variables are PE Ratio (Price to earnings ratio as measured by the ratio of market price of stock to earning per share, in times) and CGY (Capital gain yield as measured by the ratio of change in price of stock to previous year stock price, in percentage). The independent variables are GDP (Gross Domestic Product of the country, Rs. in billion), INF (Inflation as measured by change in the consumer price index, in percentage), M2 (Broad money supply, Rs. in billion), IBR (Interbank rate, in percentage), PCI (Per Capita GNI, in Rs.), REM (Remittance, Rs. in billion).

Variables	PE Ratio	CGY	GDP	INF	M2	IBR	PCI	REM
PE Ratio	1							
CGY	0.076	1						
GDP	-0.078	-0.354**	1					
INF	0.006	0.300**	-0.637**	1				
M2	-0.007	-0.277**	0.958**	-0.508**	1			
IBR	-0.167	-0.405**	0.893**	-0.565**	0.772**	1		
PCI	-0.053	-0.321**	0.991**	-0.573**	0.979**	0.880**	1	
REM	-0.020	-0.315**	0.975**	-0.532**	0.980**	0.838**	0.985**	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 gross domestic products and PE ratio. It indicates that higher the gross domestic products, lower would be the price to earnings ratio. Similarly, there is a positive relationship between inflation and price to earnings ratio. It indicates that higher the inflation rate, higher would be the price to earnings ratio. Likewise, there is negative relationship between broad money and price to earnings ratio. It indicates that increase in broad money supply leads to decrease in price to earnings ratio. Moreover, there is a negative relationship between interbank rate and price to earnings ratio. It indicates that higher the inter-bank rate, lower would be the price to earnings ratio. Likewise, there is a negative relationship between per capita income and price to earnings ratio. It indicates that higher the per capita income, lower would be the price to earnings ratio. Furthermore, there is a negative relationship between remittance and price to earnings ratio. It indicates that increase in remittance leads to decrease in price to earnings ratio.

On the other hand, the result also shows that there is a negative relationship between gross domestic products and capital gain yield. It indicates that higher the gross domestic products, lower would be the capital gain yield. Similarly, there is a positive relationship between inflation and capital gain yield. It indicates that higher the inflation, higher would be the capital gain yield. Likewise, there is negative relationship between broad money and capital gain yield. It indicates that increase in broad money leads to decrease in capital gain yield. Moreover, there is a negative relationship between interbank rate and capital gain yield. It indicates that higher the inter-bank rate, lower would be the capital gain yield. Likewise, there is a negative relationship between per capital income and capital gain yield. It indicates that higher the per capital income, lower would be the capital gain yield. Furthermore, there is a negative relationship between remittance and capital gain yield. It indicates that higher the remittance, lower would be the capital gain yield.

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 gross domestic products, interbank rate, broad money, per capita income, inflation

and remittance on price to earnings ratio of Nepalese insurance companies.

Table 4

Estimated regression results of gross domestic products, interbank rate, broad money, per capita income, inflation and remittance on price to earnings ratio of Nepalese insurance companies

The results are based on time series data for the period from 2012/13 to 2021/22 by using the linear regression model and the model is $PE\ Ratio = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 M2 + \beta_4 IBR + \beta_5 PCI + \beta_6 REM + e_{it}$ where, the dependent variable is PE Ratio (Price to earnings ratio as measured by the ratio of market price of stock to earning per share, in times). The independent variables are GDP (Gross Domestic Product of the country, Rs. in billion), INF (Inflation as measured by change in the consumer price index, in percentage), M2 (Broad money supply, Rs. in billion), IBR (Interbank rate, in percentage), PCI (Per Capita GNI, in Rs.), REM (Remittance, Rs. in billion).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		GDP	INF	BM	IBR	PCI	REM			
1	80.333 (1.746)	-0.018 (0.837)						0.003	57.0	0.701
2	41.048 (2.408)*		0.167 (0.065)					0.009	57.18	0.004
3	43.079 (3.0)**			-0.001 (0.076)				0.009	57.18	0.006
4	58.51 (5.58)**				-6.166 (1.809)			0.019	56.37	3.272
5	55.17 (2.346)*					-0.002 (0.572)		0.006	57.09	0.372
6	47.868 (1.74)						-0.007 (0.215)	0.008	57.17	0.046
7	115.58 (1.556)	-0.028 (1.03)	-2.007 (0.606)					0.008	57.16	0.532
8	582.82 (3.647)**	-0.306 (3.438)	-7.351 (2.055)	0.048 (3.267)**				0.071	54.86	3.942
9	574.58 (1.926)	-0.301 (1.727)	-7.293 (1.819)	0.048 (2.211)*	-0.354 (0.033)			0.063	55.11	2.93
10	505.134 (1.695)	-0.556 (2.479)	-7.301 (1.838)	-0.056 (0.900)	-33.722 (1.563)	0.009 (1.780)		0.081	54.58	3.023
11	513.35 (1.771)	-0.804 (3.391)	-9.912 (2.487)	-0.128 (1.932)	-48.234 (2.226)	0.011 (2.361)*	0.613 (2.682)	0.103	53.1	3.861

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. Price to earnings ratio is the dependent variable.

Table 4 shows that the beta coefficients for gross domestic products are negative with price to earnings ratio. It indicates that gross domestic products have a negative impact on price to earnings ratio. This finding is similar to the findings of Singh *et al.* (2011). Similarly, the beta coefficients for inflation are positive with price to earnings ratio. It indicates that inflation has a positive impact on price to earnings ratio. This finding is consistent with the findings of Mawardi *et al.* (2019). Likewise, the beta coefficients for broad money are negative with price to earnings ratio. It indicates that broad money has a negative impact on price to earnings ratio. This finding is similar to the findings of Ibukun *et al.* (2021). Furthermore, the beta coefficients for inter-bank rate are negative with price to earnings ratio. It indicates that inter-bank rate has a negative impact on price to earnings ratio. This finding is consistent with the findings of Ali and Moqet (2019). Similarly, the beta coefficients for per capita income are negative with price to earnings ratio. It indicates that per capita income has a negative impact on price to earnings ratio. This finding is consistent with the findings of Kartikaningsih *et al.* (2023). Similarly, the beta coefficients for remittance are negative with price to earnings ratio. It indicates that remittance has a negative impact on price to earnings ratio. This finding is similar to the findings of Chowdhury (2019).

Table 5 shows the regression results of gross domestic products, interbank rate, broad money, per capita income, inflation and remittance with capital gain yield.

Table 5

Estimated regression results of gross domestic products, interbank rate, broad money, per capita income, inflation and remittance with capital gain yield

The results are based on time series data for the period from 2012/13 to 2021/22 by using the linear regression model and the model is $CGY = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 M2 + \beta_4 IBR + \beta_5 PCI + \beta_6 REM + e_{it}$ where, the dependent variable is CGY (Capital gain yield as measured by the ratio of change in price of stock to previous year stock price, in percentage). The independent variables are GDP (Gross Domestic Product of the country, Rs. in billion), INF (Inflation as measured by change in the consumer price index, in percentage), M2 (Broad money supply, Rs. in billion), IBR (Interbank rate, in percentage), PCI (Per Capita GNI, in Rs.), REM (Remittance, Rs. in billion).

Model	Intercept	Regression coefficients of						Adj. R ²	SEE	F-value
		GDP	INF	BM	IBR	PCI	REM			
1	622.88 (4.423)**	-0.262 (4.038)						0.117	174.54	16.304
2	-105.82 (-2.053)		26.69 (3.355)**					0.082	178.02	11.258
3	186.65 (4.114)**			-0.038 (3.075)				0.068	179.31	9.456
4	187.981 (5.922)**				-48.769 (4.727)			0.157	170.63	22.346
5	314.602 (4.322)**					-0.002 (3.619)		0.095	176.73	13.094
6	353.867 (4.151)**						-0.377 (3.538)	0.091	177.13	12.516
7	426.944 (1.885)	-0.203 (2.412)	11.155 (1.104)					0.119	174.37	8.776
8	1423.768 (2.852)**	-0.795 (2.86)	-0.247 (0.022)	-0.103 (2.231)*				0.149	171.38	7.716
9	641.087 (0.691)	-0.329 (0.608)	5.301 (0.425)	-0.054 (0.806)	-33.513 (1.001)			0.149	171.38	6.037
10	134.91 (0.156)	-2.191 (3.365)	5.238 (0.455)	-0.703 (3.897)	-276.836 (4.423)	-0.063 (4.472)**		0.273	158.36	9.657
11	142.219 (0.164)	-2.411 (3.405)	2.917 (0.245)	-0.767 (3.88)	-289.736 (4.475)	-0.065 (4.532)**	-0.545 (0.798)	0.271	158.63	8.127

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.
- Capital gain yield is the dependent variable.

Table 5 shows that the beta coefficients for gross domestic products are negative with capital gain yield. It indicates that gross domestic products have a negative impact on capital gain yield. This finding is similar to the findings of Reddy (2012). Similarly, the beta coefficients for inflation are positive with capital gain yield. It indicates that inflation have a positive impact on capital gain yield. This finding is consistent with the findings of Giri and Joshi (2017). Likewise, the beta coefficients for broad money are negative with capital gain yield. It indicates that broad money has a negative impact on capital gain yield. This finding is similar to the findings of Qing and Kusairi (2019). Furthermore, the beta coefficients for inter-bank rate are negative with capital gain yield. It indicates that inter-bank rate has a negative impact on capital gain yield. This finding is similar to the findings of Batool (2021). Similarly, the beta coefficients for per capita income are negative with capital gain yield. It indicates that per capita income has a negative impact on capital gain yield. This finding is consistent with the findings of Oluwatoyin and Ocheja (2009). Similarly, the beta coefficients for remittance are negative with capital gain yield. It indicates that remittance has a negative impact on capital gain yield. This finding is similar to the findings of Ali (2011).

4. Summary and conclusion

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. Investment in shares offers the benefit of liquidity as well as the opportunity to beat the market and earn high returns. However, the task of predicting share prices is far from simple. Share price movement is not independent in nature and both intrinsic as well as extrinsic factors have been established to exercise influence over stock price movements. Stock market are essential for economic growth as they insure the flow of resources to the most productive investment opportunities. In essence, a large number of economic variables like gross domestic product, interest rate, current account, money supply, employment, their information etc. have an impact on daily stock prices

This study attempts to analyze the effect of macro-economic variables on the stock returns in the context of Nepalese insurance companies. The study is based on secondary data for the study period from 2012/13 to 2021/22.

The major conclusion of this study is that gross domestic products, interbank rate, money supply, per capita income and remittance have negative impact on price to earnings ratio and capital gain yield. In economies heavily reliant on remittances, a significant inflow can lead to an appreciation of the local currency, impacting export competitiveness and overall economic balance. This can reduce corporate earnings growth, leading to lower stock prices and thus a decreased P/E ratio. Additionally, remittance flows might be directed into safer, less volatile assets rather than equities, resulting in lower capital gain yields. However, inflation has positive impact on stock market returns. The study concluded that inflation is the most influencing factor that explain the capital gain yield of Nepalese insurance companies.

References

- Abbas, S., S. H. Tahir, and S. Raza, 2015. Impact of macroeconomic variables on stock returns: Evidence from KSE-100 Index of Pakistan. *Research Journal of Economic and Business and Studies* 3(7), 70-77.
- Abdullahi, I. B., 2020. Effect of unstable macroeconomic indicators on banking sector stock price behaviour in Nigerian Stock Market. *International Journal of Economics and Financial Issues* 10(2), 1-5.
- Ali, J., and A. A. Moqeeet, 2019. Interest rates and stock prices: Evidence from Pakistan stock exchange. *International Journal of Business and Management* 21(10), 30-34.
- Ali, M. B., 2011. Impact of micro and macroeconomic variables on emerging stock market return: A case on Dhaka stock exchange (DSE). *Interdisciplinary Journal of Research in Business* 1(5), 8-16.
- Batool, K., 2021. Impact of interest rates on stock index: Case of Pakistan Stock Exchange. *International Journal of Business and Economic Affairs* 6(1), 1-12.
- Chowdhury, E. K., 2019. An empirical study of volatility in Chittagong Stock Exchange. *CIU Journal* 2(1), 19-38.
- 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.
- Garnia, E., D. Rizal, T. Tahmat, and A. A. F. Lebeharia, 2022. Impacts of macroeconomic factors on stock returns in the property sector. *KnE Social Sciences* 2(1), 59-68.
- Gautam, A., and N. B. Bista, 2019. Factors affecting share price of Nepalese non-life insurance companies. *Nepalese Journal of Insurance and Social Security* 2(2), 22-31.
- Giri, A. K., and P. Joshi, 2017. The impact of macroeconomic indicators on Indian stock prices: an empirical analysis. *Studies in Business and Economics* 12(1), 61-78.

- Gu, G., W. Zhu, and C. Wang, 2022. Time-varying influence of interest rates on stock returns: evidence from China. *Economic Research-Ekonomska Istraživanja* 35(1), 2510-2529.
- Haque, M. N., 2016. Impact of some selected macroeconomic variables (money supply and deposit interest rate) on share prices: A study of Dhaka Stock Exchange (DSE). *International Journal of Business and Economics Research* 5(2), 10-11648.
- Ibukun, F. O., A. T. Ogundele, K. S. Effange, and S. O. Aruleba, 2021. Money Supply, Exchange Rate and Stock Market Performance in Nigeria (1986-2020). *IOSR Journal of Humanities and Social Science* 26(10), 15-22.
- Kartikaningsih, D., D. Nugraha, and M. Sari, 2023. Moderation of per capita income on macroeconomic effects on stock return. *Journal of Survey in Fisheries Sciences* 10(4), 82-94.
- Mahzabeen, S., 2016. Impact of money, interest rate and inflation on Dhaka Stock Exchange (DSE) of Bangladesh. *Journal of Business and Technology (Dhaka)* 11(1), 41-54.
- Mawardi, I., T. Widiastuti, and P. S. Sukmaningrum, 2019. The impact of macroeconomic on islamic stock prices: Evidence from Indonesia. *KnE Social Sciences* 2(1), 499-509.
- Menike, L., 2006. The effect of macroeconomic variables on stock prices in emerging Sri Lankan stock market. *Sabaragamuwa University Journal* 6(1), 50-67.
- Okech, T. C., and M. Mugambi, 2016. Effect of macroeconomic variables on stock returns of listed commercial banks in Kenya. *International Journal of Economics, Commerce and Management, United Kingdom* 4(6), 390-418.
- Oluwatoyin, S., and C. O. Momoh, 2009. The impact of stock market earnings on Nigerian per capita income. *African Journal of Accounting, Economics, Finance and Banking Research* 5(5), 1-12.
- Osoro, C., 2020. Diaspora remittances and stock market development at Nairobi Securities Exchange, Kenya. *Diaspora* 11(6), 44-65.
- Poudel, R. L., 2016. Determinant of stock price of selected banks in Nepal. *International Journal in Management and Social Science* 4(9), 541-549.
- 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.
- Rahman, M., 2008. Influences of money supply and oil price on US stock market. *North American Journal of Finance and Banking Research* 2(2), 1-12.
- Reddy, D. L., 2012 Impact of inflation and GDP on stock market returns in India. *International Journal of Advanced Research in Management and Social Sciences* 1(6), 120-136.
- Senturk, M., G. S. Özkan, and Y. E. Akbaş, 2014. The relationship between economic growth and stock returns: an example from Turkey. *Doğuş Üniversitesi Dergisi* 15(2), 155-164.
- Shrestha, P. M., 2019. Relationship between macroeconomic variables and stock market price of Nepalese insurance companies. *Economic Review of Nepal* 2(1), 104-120.
- Singh, T., S. Mehta, and M. S. Varsha, 2011. Macroeconomic factors and stock returns: Evidence from Taiwan. *Journal of Economics and International Finance* 3(4), 217-227.
- Thapa, K. B., 2019. Influencing factors of stock price in Nepal. *NCC Journal*, 4(1), 113-120.
- Widiastuti, M., A. D. Dewantoro, and T. W. Panjaitan, 2017. Impact analysis of total money supply, stock trading volume, inflation, interest rate and rupiah exchange rate on JCI in Indonesia stock exchange. *International Journal of Innovative Research and Development* 6(8), 186-194.

Chapter 32

Impact of Gross Domestic Product on the Nepalese Stock Market

Rohit Khadka and Dr. Gangadhar Dahal*

Abstract

This study examines the impact of gross domestic product on the performance of the Nepalese Stock Market. Nepse Index and Sensitive Index are the selected dependent variables. The selected independent variables are gross domestic product, inflation, interest rate, exchange rate, gold price and FDI. The study is based on secondary data for the study period from 2014 to 2023. The data were collected from current macroeconomic and financial situation and monetary policy published by Nepal Rastra Bank, and the Nepal Stock Exchange. The correlation coefficients and regression models are estimated to test the significance and importance of gross domestic product, inflation, interest rate, exchange rate, gold price and FDI on the performance of the Nepalese stock market.

The study showed that GDP has a positive impact on Nepse Index and Sensitive Index. It indicates that increase in GDP leads to increase in Nepse Index and Sensitive Index. Similarly, inflation has a negative impact on Nepse Index and Sensitive Index. It means that higher the inflation, lower would be the Nepse Index and Sensitive Index. Moreover, interest rate has a positive impact on Nepse Index and Sensitive Index. It indicates that higher the interest rate, higher would be the Nepse Index and Sensitive Index. Likewise, exchange rate has a positive impact on Nepse Index and Sensitive Index. It indicates that increase in exchange rate leads to increase in Nepse Index and Sensitive Index. In addition, gold price has a positive impact on Nepse Index and Sensitive Index. It indicates that increase in gold price leads to increase in Nepse Index and Sensitive Index. Furthermore, FDI has a positive impact on Nepse Index. It implies that higher the FDI, higher would be the Nepse Index and Sensitive Index.

Keywords: Nepse Index, Sensitive Index, gross domestic product, inflation, interest rate, exchange rate, gold price, foreign direct investment

1. Introduction

The stock market serves as a crucial gauge of economic vitality, reflecting the collective sentiment of investors and the performance of publicly traded companies within an economy (Zakhidov, 2024). In economic discourse, the stock market stands as a fundamental indicator for assessing the health, growth prospects, and investor confidence within a country's financial system. The stock market provides a platform for capital formation, investment, and wealth creation, enabling companies to raise funds for expansion and innovation. Moreover, the stock market serves as a mechanism for price discovery, allocating resources efficiently and facilitating economic growth. The stock market operates as a dynamic marketplace where investors buy and sell shares of publicly traded companies, driven by factors such as earnings reports, economic indicators, corporate news, and investor sentiment (Gavious and Kedar-Levy, 2013). Market participants, including individual investors, institutional investors, and market makers, engage in trading activities with the aim of maximizing returns and managing risk. As a result, stock prices fluctuate in response to changing economic conditions and investor expectations. The stock market serves as a rich source of information for economic analysis, offering insights into

* Mr. Khadka is a Freelance Researcher, Kathmandu, Nepal and Dr. Dahal is the Managing Director, Uniglobe College (Pokhara University Affiliate), Kathmandu, Nepal.

investor confidence, corporate performance, and future economic prospects (French and Roll, 1986).

Gross Domestic Product (GDP) stands as a pivotal measure of a nation's economic health, reflecting the total value of all goods and services produced within its borders over a specified period (Mankiw and Romer, 1989). In economic discourse, GDP serves as a fundamental indicator for assessing the overall economic performance, growth trajectory, and standard of living within a country. GDP holds paramount significance in economic analysis, serving as a key metric for policymakers, economists, investors, and businesses (Barro and Gordon, 1983). It provides a comprehensive snapshot of a country's economic activity, allowing for comparisons across time periods, regions, and economies. Moreover, GDP serves as a basis for formulating economic policies, assessing productivity, determining income distribution, and evaluating living standards. The calculation of GDP entails the aggregation of the value-added contributions of all sectors of the economy, including agriculture, industry, services, and government expenditure (Blanchard and Quah, 1989). Various approaches, including the production approach, income approach, and expenditure approach, are employed to estimate GDP, each offering insights into different aspects of economic activity. Despite methodological differences, these approaches converge to provide a comprehensive measure of a nation's economic output. GDP serves as a foundational concept in economic analysis, underpinning theories of economic growth, business cycles, and development (Romer, 1993). Additionally, GDP per capita, which divides GDP by the population, serves as a proxy for standard of living and income distribution, offering insights into the welfare of a nation's citizens.

Ahmed and Noman (2017) found a positive correlation between GDP growth and stock market performance in emerging markets, highlighting the role of economic expansion in fostering investor confidence and equity market growth. Similarly, Khan and Khan (2018) observed a strong relationship between GDP growth and stock market returns in South Asian countries, including Nepal, attributing the phenomenon to increased corporate earnings and investor optimism. Izedonmi and Abdullahi (2011) conducted a study on the effects of macroeconomic factors on the Nigerian stock returns. Using the Ordinary Least Square (OLS), the study found the probability value for market capitalization 0.12, for the exchange rate 0.16 and for the inflation 0.29. All the probability values are greater than 0.05 which implies that they do not have significant influence on the firms in different sectors. The study, therefore, concluded that macroeconomic factor has no significant influence in the Nigerian stock exchange market. Joseph (2012) assessed the effect of foreign exchange and interest rate changes on UK firms in the chemical, electrical, engineering and pharmaceutical industries for the period of 1988 to 2000. The results revealed that industry returns were more negatively affected by interest rate changes than by foreign exchange rate changes. The negative effects of interest rate changes and foreign exchange rate changes appeared more evident for the electrical and engineering sectors. Masuduzzaman (2012) found that consumer price index, broad money supply and industrial production impact positively where exchange rate against dollar and interest rate impact negatively on the stock market index of Bangladesh. But none of these macroeconomic variables have significant impact on the stock market return. Barakat and Hanafy (2015) found that CPI, exchange rate and money supply have positive impact on stock market index while interest rate has negative impact on stock market index in the context of Egypt and Tunisia. Interest rate, gold price, exchange rate and money supply all have considerable impact on stock returns in India (Nisha, 2015). GDP growth usually leads to higher disposable incomes, which boosts consumer spending. Higher consumer spending can increase corporate revenues and profits, leading to higher stock prices. Additionally, businesses are more likely to invest in expansion during periods of economic growth, further supporting stock market performance.

Ariff and Jusoff (2010) found that there is a positive relationship between GDP growth and

stock market performance in the ASEAN-5 countries. Stock prices are fundamentally driven by the expected future earnings of companies. When GDP grows, companies generally experience increased sales and revenue, leading to higher profits. This, in turn, makes their stocks more attractive to investors, driving up stock prices. Similarly, Ahmed and Hossain (2017) found that GDP growth had a positive impact on stock market performance in Bangladesh. In a growing economy, central banks might raise interest rates to prevent overheating. While higher interest rates can have a mixed impact on stocks (as they increase the cost of borrowing), they generally reflect a strong economy, which can be positive for stocks. Conversely, low or stable interest rates during economic growth can further fuel stock market performance by making borrowing cheaper for companies and consumers. Omodero and Mlaga (2019) reported GDP had a significant positive relationship on stock market performance. Li and Wang (2020) found a positive correlation between FDI inflows and stock market development in emerging Asian economies. The interplay between FDI inflows and inflation rate dynamics further influenced stock market performance in Nepal. GDP growth tends to boost investor confidence. When the economy is growing, investors feel more optimistic about the future, which can lead to increased investment in the stock market. This increased demand for stocks drives prices higher. Khan and Khan (2018) suggested that FDI inflows can have a stabilizing effect on the stock market during periods of high inflation, as foreign capital injections inject liquidity and mitigate downside risks. Conversely, inflationary pressures can deter foreign investors and dampen FDI inflows, exacerbating market volatility and liquidity constraints.

A healthy financial system that mobilizes and efficiently allocates savings and resources to the productive sectors is essential for economic growth. Caporale et al. (2004) assessed the causal link between stock market development and economic growth in seven countries (Argentina, Chile, Greece, Korea, Malaysia, Philippines and Portugal). The findings argued that a well-developed stock market can foster economic growth in the long run. It also provides support to theories according to which well-functioning stock markets can promote economic development by fueling the engine of growth through faster capital accumulation, and by tuning it through better resource allocation. Similarly, Filer et al. (2010) found that causality is unidirectional from stock market development to economic growth. However, the causality relationship is rejected for the countries in which the stock market is small and less liquid (Ake, 2010). Likewise, Osamwonyi and Kasimu (2013) examined the causal connection between stock market expansion and economic development in Ghana, Kenya and Nigeria from 1989 to 2009. The study found that equity market development and economic expansion has no casual association in the economy of Ghana and Nigeria.

In the context of Nepal, Bhandari (2023) explored the connection between the capital market and Nepal's GDP growth from 1994 to 2002. The study examined how capital market performance affects the GDP growth of Nepal. The ARDL approach was used to examine the capital market's long-term effect on economic growth. To this extent, variables like market capitalization, gross fixed capital formation as investment, broad money supply, the NEPSE Index, the number of listed companies in NEPSE, and recurring expenditures were used in the system, affecting GDP growth. According to the study, the correlation shows the presence of a strong linkage between the capital market and GDP growth in Nepal. The findings showed that the capital market has a significant influence on GDP growth. Bist (2017) examined the empirical relationship between stock market development and economic growth in Nepal over the period of 22 years from 1993 to 2014. Estimates of ARDL approach to cointegration indicate that economic growth, market capitalization, gross capital formation and inflation shared a stable long-run relationship in Nepal. The magnitudes of the ECT coefficients suggest that the speed of adjustment in estimated model is reasonably good. Findings indicate that market capitalization has a significant positive impact on the economic growth in both long as well as in short run. However, results shows that inflation has negative and significant impact on GDP per capita of Nepal in long as

well as short run. The Granger causality test indicates that there is bi-directional causality between market capitalization and economic growth in Nepal. Therefore, this study concludes that development of stock markets and economic growth has positive long run cointegrating relationship in Nepal.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of GDP and other macroeconomic factors on the performance of stock market. 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 GDP and other macroeconomic factors on performance of Nepalese stock market. Specifically, it examines the relationship of gross domestic product, inflation, interest rate, exchange rate, gold price and FDI with NEPSE Index and Sensitive Index of Nepalese stock market.

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 gathered from 2014 to 2023. The main sources of data include current macroeconomic and financial situation, monetary policy published by Nepal Rastra Bank and Nepal Stock Exchange. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of variables selected for the study along with the study period and number of observations.

Table 1

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

S. N.	Name of the variable	Study period	Observations
1	Nepse Index	2014 - 2023	120
2	Sensitive Index	2014 - 2023	120
3	Gross Domestic Product	2014 - 2023	10
4	Inflation	2014 - 2023	10
5	Interest rate	2014 - 2023	10
6	Exchange rate	2014 - 2023	10
7	Gold Price	2014 - 2023	10
8	Foreign Direct Investment	2014 - 2023	10

The model

The model used in this study assumes that performance of the stock market depends on GDP and other macroeconomic variables. The dependent variables selected for the study are Nepse Index and Sensitive Index. Similarly, the selected independent variables in this study are Gross Domestic Product, Inflation, Interest rate, Exchange rate, Gold Price and FDI. Therefore, the models take the following forms:

$$NI = \beta_0 + \beta_1 \text{GDP}_{it} + \beta_2 \text{INF}_{it} + \beta_3 \text{IR}_{it} + \beta_4 \text{ER}_{it} + \beta_5 \text{GP}_{it} + \beta_6 \text{FDI}_{it} + e_{it}$$

$$SI = \beta_0 + \beta_1 GDP_{it} + \beta_2 INF_{it} + \beta_3 IR_{it} + \beta_4 ER_{it} + \beta_5 GP_{it} + \beta_6 FDI_{it} + e_{it}$$

Where,

NI = Nepse Index as measured by the aggregating the market capitalizations of all the selected companies and dividing the total by a predetermined divisor, in points.

SI = Sensitive Index as measured by performance of a select group of sensitive or blue-chip stocks listed on the Nepal Stock Exchange (NEPSE), in points.

GDP = Gross Domestic Product total monetary value of all goods and services produced within a country's borders over a specific time period, \$ in billions.

INF = Inflation, in percentage.

IR = Interest rate on 91 day Treasury bill, in percentage.

ER = Exchange rate between Nepalese Rupees and US dollar, in Rs.

GP = Gold Price, in Rs.

FDI = Foreign Direct Investment, \$ in billion.

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

Gross domestic product

GDP serves several critical functions in economic analysis. Firstly, it provides a comprehensive measure of a country's economic output, enabling comparisons of economic performance over time and across nations. Secondly, policymakers rely on GDP data to formulate and evaluate economic policies aimed at promoting growth and stability (Stock and Watson, 2015). Lastly, GDP guides business and investment decisions by offering insights into market conditions and growth prospects. Shahbaz et al. (2008) found that there is bi-directional causality between stock market development and economic growth in the long run. Likewise, Rana (2014), using Engle-Granger and Johansen's cointegration test on the time series data from 1988 to 2013, found long run cointegrating relationship between stock market development and economic growth in Nepal. Based on it, this study develops the following hypothesis.

H₁: There is a positive relationship between GDP and Nepalese stock market.

Inflation

Consumer Price Index (CPI) is a commonly used measure of inflation. Changes in inflation can influence the stock market. Higher inflation can lead to an increase in interest rates, which can reduce consumer spending and investment, potentially leading to a decline in stock market performance. On the other hand, lower inflation can result in lower interest rates, which can stimulate investment and consumer spending, leading to an increase in stock market performance (Otieno et al., 2019). Omodero and Mlangi (2019) reported that inflation rate had a significant negative impact on all share price index. Saleem et al. (2013) revealed that there is a long run negative relationship between inflation and stock return in the context of Pakistan. Based on it, this study develops the following hypothesis.

H₂: There is a negative relationship between inflation rate and Nepalese stock market.

Interest rate

An interest rate is the percentage of principal a lender charges for using its funds. The principal is the amount of cash granted. Omodero and Mlenga (2019) reported that interest rate has a significant negative impact on all share price index. Moreover, changes in interest rates can impact equity valuations, with higher interest rates typically associated with lower stock prices due to higher discount rates (Fama, 1981). Alzoub (2022) conducted a study on the effect of consumer price index, interest rate, real economic activity, and domestic credit on the Amman Stock market return. The study found that the interest rate and consumer price index are significantly impacting the Amman stock market returns. Interest rates have profound effects on financial markets, particularly bond markets and stock markets. Rising interest rates tend to depress bond prices, leading to capital losses for bondholders, while falling interest rates had the opposite effect (Fabozzi, 2008). Based on it, this study develops the following hypothesis.

H₃: There is a negative relationship between interest rate and Nepalese stock market.

Exchange rate

An exchange rate is a rate at which one currency will be exchanged for another currency and affects trade and the movement of money between countries. Zeeshan (2022) examined the effect of macro-economic factors on Pakistan Stock Exchange returns. The study found that exchange rate has positive association with the Pakistan stock market returns. Alam (2020) assessed the effect of macro-economic factors on the stock market returns of south Asian region. The study found that exchange rate has direct association with the stock market return. Sharma and Mehendru (2010) found that inflation rate and exchange rate negatively impacted the stock price index where foreign exchange reserve and gold price positively impact the market. Mishra (2004), using monthly data for the period 1992 to 2002, examined the relationship between stock market and foreign exchange markets using Granger causality test and Vector Auto Regression technique. The study suggested that there is a positive relationship between the exchange rate return and stock return. Based on it, this study develops the following hypothesis.

H₄: There is a positive relationship between exchange rate and Nepal stock market.

Gold price

The relationship between gold prices and stock market indices is not always straightforward and can be influenced by a variety of factors. Traditionally, gold has been considered a safe-haven asset, meaning that investors tend to flock to it during times of economic uncertainty or market volatility. In such situations, when stock market indices decrease, gold prices may increase as investors seek out assets perceived to be safer. Mishra *et al.* (2010) and Lee *et al.* (2012) confirmed that there is a significant relationship with the Stock market and Gold price. The study found that stock market is a reason for increasing the gold price. Dee *et al.* (2013) examined whether gold serves as a hedge for stock or/and inflation in China mainland market. The study used quantile regression and binary probit model in the study. The empirical result showed that for short-term investors, gold always cannot hedge stock and inflation risk. But it is actually a good hedge for stock or inflation if an investor holds gold for a long time. Based on it, this study develops the following hypothesis.

H₃: There is a positive relationship between gold price and Nepalese stock market.

Foreign direct investment

FDI brings additional capital into the host country, which can be invested in various sectors of the economy. This influx of capital can boost the financial markets by increasing liquidity and providing funds for investment (Tsagkanos et al., 2019). Odo et al. (2016) assessed the impact of foreign direct investment on stock market growth in Nigeria. The study found a positive association between foreign direct investment and stock market growth. The entry of foreign investors often signals confidence in the host country's economic prospects, enhancing local and international investor sentiment and boosting stock prices (Arcabic et al., 2013). Based on it, this study develops the following hypothesis.

H₃: There is a positive relationship between foreign direct investment and Nepalese stock market.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2014 to 2023.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of NEPSE for the study period from 2014 to 2023. The dependent variables are NI (Nepse Index as measured by aggregating the market capitalizations of all the selected companies and dividing the total by a predetermined divisor, in points) and SI (Sensitive Index as measured by performance of a select group of sensitive or blue-chip stocks, in points). The independent variables are GDP (Gross Domestic Product, \$ in billion), INF (Inflation, in percentage), IR (Interest Rate, in percentage), ER (Exchange Rate, in percentage), GP (Gold Price, in Rs.) and FDI (Foreign Direct Investment, \$ in billion).

Variables	Minimum	Maximum	Mean	Std. Deviation
NI	886.60	2708.30	1587.56	566.08
SI	191	500.50	320.85	94.64
GDP	22.72	41.34	32.04	6.72
INF	3.60	9.93	6.3270	2.16
IR	0.43	9.70	4.1110	3.42
ER	102.49	133.07	116.4190	11.07
GP	41155	103310	64378	21733.74
FDI	0.03	0.20	0.1088	0.06

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 Nepal Stock Exchange for the study period from 2014 to 2023. The dependent variables are NI (Nepse Index as measured by aggregating the market capitalizations of all the selected companies and dividing the total by a predetermined divisor, in points) and SI (Sensitive Index as measured by performance of a select group of sensitive or blue-chip stocks, in points). The independent variables are GDP (Gross Domestic Product, \$ in billion), INF (Inflation, in percentage), IR (Interest Rate, in percentage), ER (Exchange Rate, in percentage), GP (Gold Price, in Rs.) and FDI (Foreign Direct Investment, \$ in billion).

Variables	NI	SI	GDP	INF	IR	ER	GP	FDI
NI	1							
SI	0.994**	1						
GDP	0.722*	0.696*	1					
INF	-0.323	-0.320	-0.454	1				
IR	0.804**	0.785**	0.888**	-0.261	1			
ER	0.263	0.194	0.420	0.291	0.454	1		
GP	0.711*	0.671*	0.908**	-0.159	0.829**	0.621	1	
FDI	0.320	0.370	0.122	-0.639*	0.010	-0.436	-0.010	1

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

Table 3 shows that GDP has a positive relationship with Nepse Index. It means that increase in GDP leads to increase in Nepse Index. Similarly, inflation has a negative relationship with Nepse Index. It means that increase in inflation leads to decrease in Nepse Index. In contrast, there is a positive relationship between interest rate and Nepse Index. It means that increase in interest rate leads to increase in Nepse Index. Likewise, exchange rate has a positive relationship with Nepse Index. It shows that increase in the exchange rate leads to increase in the Nepse Index. Moreover, gold price has a positive relationship with Nepse Index. It indicates that increase in gold price leads to increase in Nepse Index. FDI has a positive relationship with Nepse Index. It indicates that increase in FDI leads to increase in Nepse Index.

Likewise, the result also shows that GDP has a positive relationship with Sensitive Index. It means that increase in GDP leads to increase in Sensitive Index. Similarly, inflation has a negative relationship with Sensitive Index. It means that increase in inflation leads to decrease in Sensitive Index. In contrast, there is a positive relationship between interest rate and Sensitive Index. It means that increase in interest rate leads to increase in Sensitive Index. Likewise, exchange rate has a positive relationship with Sensitive Index. It shows that higher the exchange rate, higher would be the Sensitive Index. Moreover, gold price has a positive relationship with Sensitive Index. It indicates that increase in gold price leads to increase in Sensitive Index. FDI has a positive relationship with Sensitive Index. It indicates that increase in FDI leads to increase in Sensitive Index.

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 gross domestic product, inflation, interest rate, exchange rate, gold price, and FDI with Nepse Index of Nepal Stock Exchange.

Table 4

Estimated regression results of gross domestic product, inflation, interest rate, exchange rate, gold price, and FDI with Nepse Index of Nepal Stock Exchange

The results are based on time series data for the period from 2014 to 2023 by using the linear regression model and the model is $NI = \beta_0 + \beta_1 GDP_{it} + \beta_2 INF_{it} + \beta_3 IR_{it} + \beta_4 ER_{it} + \beta_5 GP_{it} + \beta_6 FDI_{it} + e_{it}$ where, the dependent variable is NI (Nepse Index as measured by aggregating the market capitalizations of all the selected companies and dividing the total by a predetermined divisor, in points). The independent variables are GDP (Gross Domestic Product, \$ in billion), INF (Inflation, in percentage), IR (Interest rate, in percentage), ER (Exchange rate, in percentage), GP (Gold Price, in Rs.) and FDI (Foreign Direct Investment,

\$ in billion).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		GDP	INF	IR	ER	GP	FDI			
1	-359.332 (-0.534)	60.764 (2.9)**						0.461	415.58	8.699
2	2123.150 (3.641)**		-84.652 (0.9645)					0.008	568.23	0.932
3	1040.308 (5.712)**			133.119 (3.828)**				0.603	356.82	14.651
4	20.205 (0.010)				13.463 (0.772)			0.047	579.23	0.596
5	395.764 (0.904)					0.019 (2.8)**		0.443	422.36	8.167
6	1296.826 (3.672)**						2673.173 (0.957)	0.010	568.77	0.915
7	-377.413 (-0.340)	61.004 (2.46)*	1.643 (0.0021)					0.384	444.25	3.806
8	1579.864 (0.993)	10.543 (0.210)	-39.610 (0.532)	145.001 (1.590)				0.494	402.48	3.935
9	1579.864 (0.993)	6.213 (0.105)	-28.261 (0.285)	144.610 (1.453)	3.609 (0.199)			0.398	439.17	2.488
10	4325.892 (1.460)	98.462 (0.988)	-94.770 (0.843)	165.299 (1.683)	11.990 (0.629)	0.027 (1.147)		0.434	425.92	2.380
11	2384.310 (0.586)	65.531 (0.578)	-24.858 (0.164)	156.907 (1.500)	5.231 (0.237)	0.018 (0.643)	2562.689 (0.751)	0.365	451.22	1.861

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.
- Nepse Index is the dependent variable.

Table 4 shows that the beta coefficients for GDP are positive with Nepse Index. It indicates that GDP has a positive impact on Nepse Index. This finding is similar to the findings of Omodero and Mlangi(2019). The beta coefficients for Inflation are negative with Nepse Index. It indicates that Inflation has a negative impact on Nepse Index. This finding is consistent with the findings of Saleem et al. (2013). Similarly, the beta coefficients for Interest rate are positive with Nepse Index. It indicates that Interest rate has a positive impact on Nepse Index. This finding is similar to the findings of Alzoub (2022). Likewise, the beta coefficients for Exchange rate are positive with Nepse Index. It indicates that Exchange rate has a positive impact on Nepse Index. This finding is consistent with the findings of Alam (2020). Moreover, the beta coefficients for Gold Price are positive with Nepse Index. It indicates that Gold Price has a positive impact on Nepse Index. This finding is similar to the findings of Dee *et al.* (2013). Furthermore, the beta coefficients for FDI are positive with Nepse Index. It indicates that FDI has a positive impact on Nepse Index. This finding is similar to the findings of Odo et al. (2016).

Table 5 shows the regression results of gross domestic product, inflation, interest rate, exchange rate, gold price, and FDI with Sensitive Index of Nepal Stock Exchange.

Table 5

Estimated regression results of gross domestic product, inflation, interest rate, exchange rate, gold price, and FDI with Sensitive Index of Nepal Stock Exchange

The results are based on time series data for the period from 2014 to 2023 by using the linear regression model and the model is $SI = \beta_0 + \beta_1 GDP_{it} + \beta_2 INF_{it} + \beta_3 IR_{it} + \beta_4 ER_{it} + \beta_5 GP_{it} + \beta_6 FDI_{it} + e_{it}$, where, the dependent variable is SI (Sensitive Index as measured by performance of a select group of sensitive or blue-chip stocks, in points). The independent variables are GDP (Gross Domestic Product, \$, in billion), INF (Inflation, in percentage), IR (Interest rate, in percentage), ER (Exchange rate, in percentage), GP (Gold Price, in Rs.) and FDI (Foreign Direct Investment, \$ in billion).

Model	Intercept	Regression coefficients of						Adj. R _{bar} ²	SEE	F-value
		GDP	INF	IR	ER	GP	FDI			
1	7.140 (0.061)	9.791 (2.739)**						0.419	72.11	7.502
2	409.571 (4.196)**		-14.023 (0.955)					0.010	95.10	0.913
3	231.54 (7.296)**			21.72 (3.585)**				0.568	62.17	12.851
4	128.246 (0.370)				1.654 (0.558)			0.083	98.48	0.311
5	132.817 (1.721)					0.003 (2.558)**		0.381	74.45	6.543
6	264.768 (4.572)**						515.653 (1.125)	0.029	93.27	1.266
7	9.531 (0.049)	9.759 (2.275)*	-0.271 (0.016)					0.336	77.08	3.282
8	348.088 (1.260)	2.616 (0.300)	-7.353 (0.569)	25.081 (1.583)				0.454	69.93	3.494
9	433.569 (1.248)	0.864 (0.086)	-2.760 (0.163)	24.923 (1.467)	-1.461 (-0.471)			0.373	74.96	2.336
10	834.694 (1.614)	15.462 (0.897)	-13.285 (0.677)	28.197 (1.645)	-2.787 (-0.837)	0.004 (1.040)		0.383	74.36	2.116
11	416.66 (0.618)	8.372 (0.445)	-1.768 (0.071)	26.390 (1.521)	-1.332 (-0.363)	0.002 (0.500)	551.763 (0.975)	0.375	74.82	1.900

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. Sensitive Index is the dependent variable.

Table 5 shows that the beta coefficients for GDP are positive with Sensitive Index. It indicates that GDP has a positive impact on Sensitive Index. This finding is similar to the findings of Rana (2014). The beta coefficients for inflation are negative with Sensitive Index. It indicates that inflation has a negative impact on Sensitive Index. This finding is consistent with the findings of Saleem et al. (2013). Similarly, the beta coefficients for interest rate are positive with Sensitive Index. It indicates that interest rate has a positive impact on Sensitive Index. This finding is similar to the findings Fabozzi (2008). Likewise, the beta coefficients for exchange rate are positive with Sensitive Index. It indicates that Exchange rate has a positive impact on Sensitive Index. This finding is consistent with the findings of Zeeshan (2022). Moreover, the beta coefficients for gold price are positive with Sensitive Index. It indicates that Gold Price has a positive impact on Sensitive Index. This finding is similar to the findings of Mishra *et al.* (2010). Furthermore, the beta coefficients for FDI are positive with Sensitive Index. It indicates that FDI has a positive impact on Sensitive Index. This finding is consistent with the findings of Tsagkanos *et al.* (2019).

4. Summary and conclusion

Gross domestic product, profoundly influences the stock market through various channels. Firstly, GDP growth is often associated with increased corporate profitability, as a growing economy typically leads to higher revenues and earnings for businesses. This positive correlation between GDP and corporate performance tends to bolster investor confidence, leading to higher stock prices. Moreover, GDP growth can signal strong consumer spending and business investment, which further fuels stock market optimism. Additionally, central banks and policymakers closely monitor GDP growth when formulating monetary policy, adjusting interest rates and liquidity measures accordingly. These policy decisions can impact borrowing costs, inflation expectations, and overall market sentiment, thereby influencing stock prices. Overall, GDP serves as a crucial indicator of economic health and growth

prospects, exerting a significant and multifaceted influence on stock market dynamics.

This study attempts to analyze the effect of gross domestic product on the performance of the Nepalese Stock Market. The study is based on secondary data for the study period from 2014 to 2023.

The major conclusion of this study is that GDP has positive impact on Nepse Index and Sensitive Index. It indicates that increase in GDP leads to increase in Nepse Index and Sensitive Index. Similarly, interest rate, exchange rate, gold price and FDI have a positive impact on Nepse Index and Sensitive Index. It indicates that increase in Interest rate, Exchange rate, Gold Price and FDI leads to increase in Nepse Index and Sensitive Index. Likewise, inflation rate has a negative impact on Nepse Index. It indicates that increase in Inflation rate leads to decrease in Nepse Index. Likewise, the study also concluded that GDP is the most influencing factor that explains the changes in the performance of the Nepalese Stock Market. Similarly, the study also concluded that interest rate and gold price are the most influencing factor that explains the changes in Sensitive Index in context of Nepal.

References

- Ahmed, S., and A. H. M. N. Noman, 2017. The impact of GDP growth on stock market performance: Evidence from emerging markets. *Journal of Economics and Finance* 41(3), 479-491.
- Alam, N. Q., 2020 Impact of macroeconomic variables on the stock market returns of South Asian Region. *Canadian Journal of Business and Information Studies* 2(2), 24-34.
- Alzoubi, M., 2022. Stock market performance: Reaction to interest rates and inflation rates. *Banks and Bank Systems* 17(2), 189-198.
- Ariff, M., and K. Jusoff, 2010. The relationship between GDP growth and stock market performance in ASEAN-5 countries. *Journal of Applied Sciences* 10(10), 860-867.
- Barakat, M., S. Elgazzar, and K. Hanafy, 2015. Impact of macroeconomic variables on stock markets: Evidence from Emerging Markets. *International Journal of Economics and Finance* 8(1), 195-201.
- Barro, R. J., and D. B. Gordon, 1983. A positive theory of monetary policy in a Natural Rate Model. *Journal of Political Economy* 91(4), 589-610.
- Blanchard, O. J., and D. Quah, 1989. The dynamic effects of aggregate demand and supply disturbances. *American Economic Review* 79(4), 655-673.
- Fabozzi, F. J., 2008. Determinants of risk premiums on corporate bonds. *Journal of Political Economy* 67(3), 217-237.
- Fama, E. F., 1981. Stock returns, real activity, inflation, and money. *American Economic Review* 71(4), 545-565.
- French, K. R., and R. Roll, 1986. Stock Return Variances: The Arrival of Information and the Reaction of Traders. *Journal of Financial Economics* 17(1), 5-26.
- Izedonmi, P. F., and I. B. Abdullahi, 2011. The effects of macroeconomic factors on the Nigerian Stock Returns: A Sectoral Approach. *Global Journal of Management and Business Research* 11 (7).
- Joseph, N. L., 2012 Modelling the impacts of interest rate and exchange rates on UK stock returns. *Derivatives Use Trading and Regulation* 7(1), 306-323.
- Dee, J., L. Li, and Z. Zheng, 2013. Is gold a hedge or a safe haven? Evidence from inflation and stock market. *International Journal of Development and Sustainability* 2(1), 1-16.

- Khan, S. A., and S. A. Khan, 2018. The relationship between GDP and stock market performance: Evidence from South Asian countries. *International Journal of Economics, Commerce and Management* 6(7), 1-15.
- Lee Y, Y. Huang, and H. Yang, 2012. The asymmetric long-run relationship between Crude Oil and Gold Futures. *Global Journal of Business Research* 6(1), 9-15.
- Li, Y., and J. Wang, 2020. Foreign direct investment and stock market development: Evidence from emerging Asian economies. *Journal of Asian Finance, Economics and Business* 7(9), 213-224.
- Mankiw, N. G., and D. Romer, 1989. New Keynesian Economics. *NBER Macroeconomics Annual* 4(1), 1-47.
- Masuduzzaman, M., 2012. Impact of the macroeconomic variables on the stock market returns: The case of Germany and the United Kingdom. *Global Journal of Management and Business Research* 12(16), 22-34.
- Mishra, A. K., 2004. Stock prices and exchange rate interlinkages in emerging financial markets: The Indian Perspective. *Proceedings of the International Conference on Business and Finance* 6(1), 19-57.
- Mishra, P. K., J. R. Das, and S. K. Mishra, 2010. Gold price volatility and stock market returns in India. *American Journal of Scientific Research* 9(9) 47-55.
- Nisha, N., 2015. Impact of macroeconomic variables on stock returns: Evidence from Bombay Stock Exchange (BSE). *Journal of Investment and Management* 4(5), 162-174.
- Omodero, C. O., and S. Mlangi, 2019. Evaluation of the impact of macroeconomic variables on stock market performance in Nigeria. *Business and Management Studies* 5(2), 34-44.
- Romer, D., 1993. Openness and Inflation: Theory and Evidence. *The Quarterly Journal of Economics* 108(4), 869-903.
- Sharma, G. D., and M. Mahendru, 2010. Impact of Macroeconomic variables on stock prices in India. *Global Journal of Management and Business Research* 10(7), 1-18.
- Stock, J. H., and M. W. Watson, 2015. *Introduction to Econometrics* (Pearson Education, Beijing, China).
- Zeeshan, A., 2022. The impact of macro-economic factors on equity market return of Pakistan Stock Exchange (PSE) *International Journal of Business and Administrative Studies* 8(2), 91-101.
- Zakhidov, G., 2024. Economic indicators: Tools for analyzing market trends and predicting future performance. *International Multidisciplinary Journal of Universal Scientific Prospective* 2(3), 23-29.
- Gavious, A., and H. Kedar-Levy, 2013. The speed of stock price discovery. *Journal of Financial Intermediation* 22(2), 245-258.
- Bhandari, K., 2023. Impact of Capital Market on GDP Growth in Nepal. *The Lumbini Journal of Business and Economics* 11(1), 308-333.
- Bist, J. P., 2017. Stock market development and economic growth in Nepal: An ARDL representation. *Journal of Finance and Economics* 5(4), 164-170.
- Caporale, G. M., P. G. Howells, and A. M. Soliman, 2004. Stock market development and economic growth: The causal linkage. *Journal of Economic Development* 29(1), 33-50.
- Osamwonyi, I. O., and A. Kasimu, 2013. Stock market and economic growth in Ghana, Kenya and Nigeria. *International Journal of Financial Research* 4(2), 83-98.
- Filer, R. K., J. Hanousek, and N. F. Campos, 2010. Do stock markets promote economic growth? *CERGE-EI*

Working Paper, Series No. 151.

- Ake, B., 2008. The role of stock market development in economic growth: Evidence from some Euronext Countries. *International Journal of Financial Research* 1(1), 14-20.
- Rana, S. B., 2014. Stock market size, liquidity and economic growth in Nepal. *The KIC Journal of Management and Economic Review* 1(2), 1-13.
- Shahbaz, M., N. Ahmed, and L. Ali, 2008. Stock market development and economic growth: ARDL Causality in Pakistan. *International Research Journal of Finance and Economics* 14(1), 182-195.
- Otieno, D. A., R. W. Ngugi, and P. W. Muriu, 2019. The impact of inflation rate on stock market returns: evidence from Kenya. *Journal of Economics and Finance* 43(1), 73-90.
- Saleem, F., L. Zafar, and B. Rafique, 2013. Long run relationship between inflation and stock return: Evidence from Pakistan. *Academic Research International* 4(2), 407-413.

Chapter 33

Effect of Interest Rate Spread on Profitability of Nepalese Commercial Banks

Priya Pradhan*

Abstract

This study examines the effect of interest rate spread 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 interest rate spread, net interest margin, capital adequacy ratio, non-performing loan, gross domestic product, and inflation 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 spread on the profitability of Nepalese commercial banks.

The study showed that 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. Likewise, 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. Similarly, 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. Likewise, net interest margin has a positive impact on return on assets and return on equity. It indicates that increase in net interest margin leads to increase in return on assets and return on equity. In addition, gross domestic product has a negative impact on return on asset and return on equity. It indicates that higher the gross domestic product, lower would be the return on assets and return on equity. Further, inflation rate has a positive impact on return on asset and return on equity. It indicates that higher the inflation rate, higher would be the return on asset and return on equity.

Keywords: interest rate spread, inflation rate, net interest margin, non-performing loan, capital adequacy ratio, gross domestic product, return on equity, return on assets

1. Introduction

The commercial banks are the most dynamic financial intermediaries who perform crucial financial functions in diverse economies of the world. The banks engage in risk transfer, deals with complex financial instruments and markets, provide market transparency, offer a payment mechanism in its operations, match supply and demand in financial markets and also perform risk management functions. Despite the fact that new avenues for commercial banks have opened up, especially in product development, market penetration strategy and provision of bundles of different services (Kenny *et al.*, 2014). Banking institutions are business entities dedicated to financial intermediation, involving the allocation of surplus liquidity among different economic agents. Banks use deposits and other liabilities from people or firms with a surplus of resources, redirecting them to economic agents who lack such resources, in the form of loans and other assets. Commercial banks play an important role in the financial service industry and become a principal financial intermediary in the fund transfer system (Bandaranayake and Jayasinghe, 2014). 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

* Ms. Pradhan is a Freelance Researcher, Kathmandu, Nepal.

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 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).

Interest rate spread is the difference between interest income received and interest paid by a bank as a ratio of total assets or difference between the ratio of interest received and all interest-bearing assets and the ratio of interest paid and all interest earning liabilities (Mujeri and Sayera, 2009). Similarly, Brock and Rojas (2000) defined interest rate spread as margin between interest income and interest expense as a percentage of total earning assets. Spread is defined by market microstructure characteristics of the banking sector and the policy environment. Risk-averse banks operate with smaller spread than risk-neutral banks since risk aversion raises the bank's optimal interest rate and reduces the amount of credit supplied. Likewise, Emmanuelle (2003) argued that actual spread, is influenced by monetary and fiscal policy. The efficiency of the banking system is reflected by series of financial indicators and more importantly by interest rate spread and net interest margin. Interest rate spread is an important indicator of efficiency level of a bank or banking system which leads to reflect the profit maximizing ability of the financial intermediaries (Bandaranayake, 2014).

High interest rate spread has far reached effect on the growth of an economy as it works against the development of financial intermediation by discouraging savers. Rising interest spread discourages savings and investments, on the one hand, and raises concerns about the effectiveness of the bank-lending channels of monetary policy, on the other. Output and employment are also affected adversely by high interest rate spread. This is because large spread diminishes savings, which in turn narrows levels of borrowing and, thus, narrows investment in the economy. Consequently, the interest rate spreads (IRS) in an economy is an indicator of inefficiency and has important implications for the growth and development of such economy. According to Aburime (2008), the significance of bank profitability can be judged at both micro and macro levels of the economy. Different types of banks have different purpose along with profitability. There are many factors influencing banks profitability with diverse ways. The relative importance of the different roles of banks varies substantially across countries and times but, bank is always critical to the financial system (Allen *et al.*, 2015).

Azumah *et al.* (2023) investigated the effect of banking sector reforms on interest rate spread of Ghana. The study revealed that bank size, profitability, gross domestic product, and inflation rate have significant impact on bank interest rate spread. Similarly, Ullah and Khan (2021) assessed the impact of interest rate spread (IRS) on the profitability of all commercial bank in Pakistan. The study showed that there is a positive and significant impact of interest rate spread on return on assets along with capital adequacy ratio and interest income, while bank liquidity exhibits an insignificant and negative impact on return on assets. Likewise, Marwansyah and Syarief (2022) analyzed the influence of capital adequacy ratio, net interest margin, gross domestic product, and inflation on the profitability of sharia banks that are listed on the financial services authority of Indonesia period 2010 to 2019. The

study found that net interest margin and capital adequacy ratio have positive impact on return on assets. However, net interest margin has a significant but negative impact on return on assets but positive and significant impact on return on equity. Likewise, the capital adequacy ratio has a positive and significant impact on return on assets but negative impact on return on equity. The results also showed that gross domestic product as an external factor that has a positive and significant impact on return on assets and return on equity, but inflation does not affect the return on assets and return on equity.

Jiang and Zheng (2024) examined the indicators of non-performing loan. The study found a significant impact of return on assets, return on equity, economic sustainability, and political instability index on non-performing loan. Similarly, Isayas (2022) investigated the determinants of banks' profitability: An empirical evidence from banks in Ethiopia. The study revealed that firm size, liquidity ratio, asset tangibility, capital adequacy, leverage, and real GDP growth rate have a positive and statistically significant impact on the profitability of banks, while firm age and the inflation rate have a negative and statistically an insignificant impact on the profitability of banks in Ethiopia. Likewise, Gazi *et al.* (2021) assessed the determinants of profitability in banking sector from Bangladesh. The study stated that both firms' specific variables (i.e. Equity to Asset Ratio, Deposit to Asset ratio, Debt to Equity Ratio, Loan to Deposit Ratio) and macroeconomic variable (GDP growth rate) have statistically significant impact on Return on Asset (ROA) and Return on Equity (ROE). Further, Terstena *et al.* (2023) analyzed the impact of inflation on the profitability of businesses operating in Kosovo. The study concluded that there is a positive impact of both inflation and profit after tax on profitability. Additionally, the study showed a positive relationship between business profitability and other factors such as inflation level, profit tax, net wages, and GDP level in Kosovo.

In the context of Nepal, Pradhan and Upadhaya (2018) examined the impact of financial structure and macro-economic variables on the financial performance of Nepalese commercial banks. The study revealed that firm size and GDP have a positive impact on financial performance of Nepalese commercial banks. Similarly, Gnawali (2018) investigated the impact of non-performing loan on profitability of Nepalese commercial banks. The study concluded that there is a negative impact of non-performing loan on return on assets. The study also conceded that non-performing loan to total loan (NPLTL), and size have negative relationship with return on assets. Likewise, Gautam (2018) examined the impact of non-performing loan on profitability of Nepalese commercial banks for the period from 2007/08 to 2016/17. The study showed that credit to deposit ratio, net profit to loan and advances, non-performing loan to total loan, interest income to loan and advance have a positive impact on return on assets. Further, Acharya and Vyas (2022) analyzed the impact of bank-specific and macroeconomic variables on commercial banks profitability in Nepal. The study found that bank-specific variables such as capital adequacy ratio, non-performing loan, and cost of funds have negative impact on banks' profitability measured by return on assets and return on equity. In contrast, interest rate spread, total investment to total asset, and net interest income to total asset have a positive impact on return on assets and return on equity. Regarding macroeconomic variables, gross domestic product has a positive impact on banks' performance, while inflation has a negative impact on both return on assets and return on equity.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of interest rate spread on profitability 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 effect of interest rate spread on profitability of Nepalese commercial banks. Specifically, it examines the relationship of interest rate spread, net

interest margin, non-performing loan, capital adequacy ratio, inflation rate, and gross domestic product 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 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	Observations
Public bank			
1	Rastriya Banijsya Bank Limited	2014/15-2022/23	9
2	Agriculture Development Bank Limited	2014/15-2022/23	
Joint venture banks			
3	Himalayan Bank Limited	2014/15-2022/23	9
4	Everest Bank Limited	2014/15-2022/23	9
5	NMB Bank Limited	2014/15-2022/23	9
Private banks			
6	Siddhartha Bank Limited	2014/15-2022/23	9
7	Citizens International Bank Limited	2014/15-2022/23	9
8	Standard Chartered Bank Limited	2014/15-2022/23	9
9	Machhapuchchhre Bank Limited	2014/15-2022/23	9
10	SBI Bank Limited	2014/15-2022/23	9
11	Sanima Bank Limited	2014/15-2022/23	9
12	Prime Commercial Bank Limited	2014/15-2022/23	9
13	Prabhu Bank Limited	2014/15-2022/23	9
Total number of observations			117

Thus, the study is based on 117 observations.

The model

The model used in this study assumes that profitability depends upon determinants of interest rate spread. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are interest rate spread, non-performing loans, capital adequacy ratio, net interest margin, inflation rate, and gross domestic product. Therefore, the models take the following forms

$$ROA = \beta_0 + \beta_1 IRS + \beta_2 NIM + \beta_3 CAR + \beta_4 NPL + \beta_5 GDP + \beta_6 INF + e_{it}$$

$$ROE = \beta_0 + \beta_1 IRS + \beta_2 NIM + \beta_3 CAR + \beta_4 NPL + \beta_5 GDP + \beta_6 INF + e_{it}$$

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.

IRS = Interest rate spread as measured by weighted average interest rate spread which is the difference between average rate of return from loans and advances and average rate of interest on deposits, in percentage.

NIM = Net interest margin as measured by the ratio of net interest income 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 loans as measured by the ratio of non-performing loans to total loans, in percentage.

GDP = Gross domestic product as measured by real gross domestic product, in billions.

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 refers to the difference between the interest rates earned on loans and investments and the interest rates paid on deposits and borrowings. Khan and Sattar (2014) examined the impact of interest rate change on the profitability of four central commercial banks in Pakistan from 2008 to 2012. The study found that interest rate spread has a strong and positive relationship with profitability. Similarly, Owusu-Antwi *et al.* (2017) investigated the interest rates spread and profitability of commercial banks in Ghana. The results showed that bank spread rate positively affect the profitability of commercial banks in Ghana but the relationship is statistically insignificant. In contrast, Obidike *et al.* (2015) assessed the impact of interest rate spread on the performance of the Nigerian banking industry from 1986 to 2012. The study concluded that interest rate spread has a negative impact on performance of banks in long run. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between interest rate spread and banks' profitability.

Net interest margin

Net interest margin is a financial metric used to evaluate the profitability of a financial institution, particularly banks. Raharjo *et al.* (2014) found that there is a positive and strong relationship between profitability and net interest margin. Similarly, Malik *et al.* (2014) revealed that there is a positive relationship between net interest margin and profitability. Likewise, Dewi and Herlina (2024) stated that there is a positive relationship between net interest margin and return on asset. Further, Wulansari and Chandra (2022) showed that net interest margin has a significant impact on return on asset. In addition, Ramadanti and Setyowati (2022) revealed that net interest margin has a significant impact on return on asset. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between net interest margin and banks' profitability.

Non-performing loan ratio

The non-performing loan (NPL) ratio is a financial metric used by banks and financial institutions to assess the quality of their loan portfolios. It represents the proportion of loans in a bank's portfolio that are considered to be at risk of default or have already defaulted. Martiningtiyas (2020) examined the effect of non-performing loans on profitability in banking sector. The study showed that non-performing loans has a significant but negative impact on profitability of banks. Similarly, Collaku and Aliu (2021) found a significant negative relationship between non-performing loan and profitability as measured by return on assets. Likewise, Brastama and Yadna (2020) revealed that non-performing loan has a negative impact on profitability of banks. Further, Sari *et al.* (2023) analyzed the impact of non-performing loans on the profits of banking companies in Indonesia. The study concluded that non-performing loans has a negative impact on profitability of the banks. Based on it, this study develops the following hypothesis:

H₃: There is a negative relationship between non-performing loan and banks' profitability.

Capital adequacy ratio

The capital adequacy ratio is a measure of a bank's capital relative to its risk-weighted assets and is used to ensure that banks can absorb a reasonable amount of loss and sustain themselves during adverse economic conditions without resorting to government intervention or insolvency. Nyabaga and Wepukhulu (2020) revealed that capital adequacy ratio has a positive impact on financial performance of listed commercial banks in Kenya. Similarly, Barus *et al.* (2017) examined the impact of capital requirement on bank's performance in Kenya. The study found that capital requirement is major determinant of bank performance and loans and advances. Likewise, Olarewaju and Akande (2016) revealed that there is a positive relationship between return on assets and capital level. Further, Setiarini (2023) concluded that capital adequacy ratio has a positive impact on return on assets. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between capital adequacy ratio and banks' profitability.

Inflation rate

Inflation refers to an overall rise in the consumer price index, which is a weighted average of prices for different goods and services (Sinclair, 2010). Jeevitha *et al.* (2019) examined the impact of inflation on bank's profitability. The study found that there is a negative correlation between inflation and banks profitability. Similarly, Moyo and Tursoy (2020) investigated the impact of inflation and exchange rate on the financial performance of commercial banks in South Africa. The study showed that there is a significant inverse relationship between inflation and the bank performance. Likewise, Alnabulsi *et al.* (2023) found that there is a positive and significant impact of GDP on bank profitability as well as a negative impact of inflation on bank profitability. Further, Ginting *et al.* (2023) assessed the influence of inflation and net profit margins on banking sector stock prices in mediation of profitability on the Indonesian Stock Exchange. The study showed that inflation and net profit margin (NPM) mediated by profitability do not affect stock prices in the banking sector. Thus, it has no significant impact on the stock prices of banking companies. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between inflation rate and banks' profitability.

GDP growth rate

Gross domestic product is often considered the best measure of how well the economy is

performing. The purpose of GDP is to summarize all the data with a single number representing the dollar value of economic activity in a given period of time. Sinişin (2020) assessed the determinants of banking profitability. The study revealed that GDP growth has a positive and significant impact on both return on assets and return on equity. Likewise, Yuan *et al.* (2022) examined the impact of the determinants of profitability on the commercial banks in Asian countries. The study found that inflation rate and the GDP growth rate are found to be positive and significant for return on assets. Further, Soukhakian and Khodakarami (2019) revealed that GDP is positively correlated to return on assets. Based on it, this study develops the following hypothesis:

H₆: There is a positive relationship between GDP growth rate and banks' 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 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 IRS (Interest rate spread as measured by weighted average interest rate spread which is the difference between average rate of return from loan and advances and average rate of interest on deposits, in percentage), NIM (Net interest margin as measured by the ratio of net interest income 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 loans as measured by the ratio of non-performing loans to total loans, in percentage), GDP (Gross domestic product as measured by real gross domestic product, in billions), and INF (Inflation rate as measured by rate of inflation in a particular year, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.22	1.57	0.50
ROE	3.78	33.11	15.12	5.28
IRS	3.09	7.15	4.23	0.63
NIM	1.82	5.60	3.12	0.68
CAR	9.37	22.99	13.73	2.41
NPL	0.01	8.83	1.54	1.54
GDP	24.36	46.10	33.60	6.77
INF	3.63	8.79	5.95	1.80

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 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 profit to total equity, in percentage). The independent variables are IRS (Interest rate spread as measured by weighted average interest rate spread which is the difference between average rate of return from loan and advances and average rate of interest on deposits, in percentage), NIM (Net interest margin as measured by the ratio of net interest income 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 loans as measured by the ratio of non-performing loans to total loans, in percentage), GDP (Gross domestic product as measured by real gross domestic product, in billions), and INF (Inflation rate as measured by rate of inflation in a particular year, in percentage).

Variables	ROA	ROE	IRS	NIM	CAR	NPL	GDP	INF
ROA	1							
ROE	0.639**	1						
IRS	0.298**	0.186*	1					
NIM	0.496**	0.206*	0.682**	1				
CAR	0.330**	0.128	0.207*	0.387**	1			
NPL	-0.019	-0.026	0.317**	0.312**	-0.146	1		
GDP	-0.531**	-0.574**	-0.259**	-0.191*	0.074	-0.001	1	
INF	0.009	0.239**	0.190*	-0.035	-0.291**	0.184*	-0.134	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 spread has a positive relationship with return on assets. It indicates that increase in interest rate spread leads to increase in return on assets. Similarly, there is a positive relationship between net interest margin and return on assets. It indicates that increase in net interest margin leads to increase in return on assets. Likewise, there is a positive relationship between capital adequacy ratio and 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 loan, lower would be the return on assets. In addition, GDP has a negative relationship with return on assets. It indicates that higher the GDP, lower would be the return on assets. Moreover, inflation rate has a positive relationship with return on assets. It indicates that higher the inflation rate, higher would be the return on assets.

Similarly, the result also shows that 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. Similarly, there is a positive relationship between net interest margin and return on equity. It indicates that increase in net interest margin leads to increase in return on equity. Likewise, there is a positive relationship between capital adequacy ratio and 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 loan, lower would be the return on equity. In addition, GDP has a negative relationship with return on equity. It indicates that higher the GDP, lower would be the return on equity. Moreover, inflation rate has a positive relationship with return on equity. It indicates that higher the inflation rate, 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 interest rate spread, net interest margin, non-performing loans, capital adequacy ratio, inflation rate and gross domestic product with return on asset of Nepalese commercial banks.

Table 4

Estimated regression results of interest rate spread, net interest margin, capital adequacy ratio, non-performing loan, gross domestic product, and inflation rate on return on assets

The results are based on panel data of 13 commercial banks with 117 observations for the period of 2014/15-2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 IRS + \beta_2 NIM + \beta_3 CAR + \beta_4 NPL + \beta_5 GDP + \beta_6 INF + e_{it}$ 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 IRS (Interest rate spread as measured by weighted average interest rate spread which is the difference between average rate of return from loan and advances and average rate of interest on deposits, in percentage), NIM (Net interest margin as measured by the ratio of net interest income 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 loans as measured by the ratio of non-performing loans to total loans, in percentage), GDP (Gross domestic product as measured by real gross domestic product, in billions), 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
		IRS	NIM	CAR	NPL	GDP	INF			
1	0.574 (1.912)	0.235 (3.350)**						0.081	0.478	11.224
2	0.436 (2.295)**		0.365 (6.126)**					0.239	0.435	37.526
3	0.637 (2.510)**			0.068 (3.751)**				0.101	0.473	14.067
4	1.584 (24.106)**				-0.006 (0.202)			0.008	0.501	0.041
5	2.889 (14.465)**					-0.039 (6.712)**		0.275	0.425	45.049
6	1.560 (9.701)**						0.002 (0.097)	0.009	0.501	0.009
7	0.571 (2.075)*	0.059 (0.679)	0.403 (4.931)**					0.236	0.436	18.905
8	0.232 (0.701)	0.046 (0.530)	0.349 (4.053)**	0.033 (1.811)				0.251	0.432	13.949
9	0.245 (0.747)	0.026 (0.300)	0.385 (4.388)**	0.023 (1.227)	-0.050 (1.750)			0.264	0.428	11.418
10	1.747 (5.082)**	0.125 (1.698)	0.330 (4.507)**	0.049 (2.973)**	-0.025 (1.044)	-0.037 (7.163)**		0.492	0.355	23.497
11	1.602 (4.340)**	0.146 (1.916)	0.342 (4.620)**	0.049 (2.973)**	-0.028 (1.148)	-0.037 (7.076)**	0.022 (1.074)	0.493	0.355	19.80

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 asset is the dependent variable.

Table 4 shows that 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 Khan and Sattar (2014). Similarly, the beta coefficients for net interest margin are positive with return on assets. It indicates that net interest margin has a positive impact on return on assets. This finding is similar to the findings of Raharjo *et al.* (2014). Likewise, 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 Nyabaga and Wepukhulu (2020). In addition, 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 Martiningtiyas (2020). Further, the beta coefficients for gross domestic product are negative with return on assets. It indicates that gross domestic product has a negative impact on return on assets. This finding is not similar to the findings of Sinişin (2020). Moreover, the beta coefficients for inflation rate are positive with return on assets. It indicates that inflation rate has a positive impact on return on assets. This finding is similar to the findings of Jeevitha *et al.* (2019).

Table 5 shows the estimated regression results of interest rate spread, net interest margin, non-

performing loans, capital adequacy ratio, gross domestic product, and inflation rate on return on equity.

Table 5

Estimated regression results of interest rate spread, net interest margin, capital adequacy ratio, non-performing loan, gross domestic product, and inflation rate on return on equity

The results are based on panel data of 13 commercial banks with 117 observations for the period of 2014/15-2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 IRS + \beta_2 NIM + \beta_3 CAR + \beta_4 NPL + \beta_5 GDP + \beta_6 INF + e_{it}$ 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 IRS (Interest rate spread as measured by weighted average interest rate spread which is the difference between average rate of return from loan and advances and average rate of interest on deposits, in percentage), NIM (Net interest margin as measured by the ratio of net interest income 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 loans as measured by the ratio of non-performing loans to total loans, in percentage), GDP (Gross domestic product as measured by real gross domestic product, in billions), 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
		IRS	NIM	CAR	NPL	GDP	INF			
1	8.506 (2.589)**	0.717 (0.688)						0.026	5.206	4.139
2	10.127 (4.473)**		1.598 (2.254)*					0.026	5.206	4.139
3	18.951 (6.725)**			0.279 (1.381)				0.008	5.255	1.908
4	14.977 (21.573)**				-0.090 (0.283)			0.008	5.297	0.080
5	30.135 (14.777)**					-0.447 (7.512)**		0.323	4.340	56.423
6	10.943 (6.633)**						0.701 (2.642)**	0.049	5.145	6.979
7	8.499 (2.591)**	0.717 (0.688)	1.142 (1.175)					0.030	5.197	2.766
8	13.932 (3.578)**	0.504 (0.492)	2.081 (1.975)	0.525 (2.464)*				0.071	5.086	3.950
9	14.051 (3.621)**	0.687 (0.667)	2.331 (2.245)*	0.614 (2.762)**	-0.460 (1.351)			0.078	5.067	3.440
10	30.882 (7.416)**	0.420 (0.471)	1.718 (1.935)	0.375 (1.947)	-0.179 (0.611)	-0.414 (6.626)**		0.333	4.309	12.586
11	27.435 (6.230)**	0.912 (1.006)	2.003 (2.266)*	0.275 (1.409)	-0.242 (0.834)	-0.405 (6.567)**	0.515 (2.141)*	0.354	4.241	11.591

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 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 similar to the findings of Owusu-Antwi *et al.* (2017). Similarly, the beta coefficients for net interest margin are positive with return on equity. It indicates that net interest margin has a positive impact on return on equity. This finding is similar to the findings of Ramadanti and Setyowati (2022). Likewise, 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 Setiarini (2023). In addition, 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 Brastama and Yadna (2020). Further, the beta coefficients for gross domestic product are negative with return on equity. It indicates that gross domestic product has a negative impact on return on equity. This finding is not similar to the findings of Soukhakian and Khodakarami (2019). Moreover, the beta coefficients for inflation rate are positive with return on equity. It indicates that inflation rate

has a positive impact on return on equity. This finding is similar to the findings of Ginting *et al.* (2023).

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 analyse the effect of interest rate spread on the 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 interest rate spread, capital adequacy ratio, net interest margin, and inflation rate have positive impact on return on assets and return on equity. It indicates that higher the interest rate spread, capital adequacy ratio, net interest margin, and inflation rate, higher would be the return on assets and return on equity. However, non-performing loan and GDP growth rate have negative impact on return on asset and return on equity. It indicates that increase in non-performing loan and GDP growth rate leads to decrease in return on assets and return on equity. Likewise, the study also concluded that net interest margin followed by interest rate spread is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese commercial banks.

References

- Aburime, T. 2008. Determinants of bank profitability: Industry-level evidence from Nigeria. *International Journal of Nigerian Studies and Development* 14(1), 21-34.
- 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.
- Allen, F., E. Carletti, and R. Marquez, 2015. Deposits and bank capital structure. *Journal of Financial Economics* 118(3), 601-619.
- Alnabulsi, K., E. Kozarevi, 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(64), 2-17.
- 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.
- Azumah, C. Y., Owusu-Ansah, A., G. Amewu, and W. Ohemeng, 2023. The effect of banking sector reforms on interest rate spread: Evidence from Ghana. *Cogent Economics and Finance* 11(1) 1-14.
- Bandaranayake, A. 2014. Causal links between macroeconomic determinants and interest rate spread. *Department of Economics and Statistics* 1(3), 1-10.
- Barus, J. J., W. Muturi, P. Kibati, and J. Koima, 2017. Effect of capital adequacy on the financial performance of savings and credit societies in Kenya. *American Journal of Finance* 1(4), 1-12.
- 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 4(12), 43-49.

- Collaku, B., and M. Aliu, 2021. Impact of non-performing loans on bank's profitability: empirical evidence from commercial banks in Kosovo. *Journal of Accounting, Finance and Auditing Studies* 7(3), 226-242.
- Dewi, P. S., and L. Herlina, 2024. The effect of net interest margin, operating cost of operating income, and loan to deposit ratio on return on asset at PT bank common wealth period 2012-2022. *Journal of Accounting and Finance Management* 4(6), 448-461.
- Emmanuelle, J. 2003. Monetary and fiscal policy. Kenya: University of Nairobi.
- Gautam, R. 2018. Impact of non-performing loan on profitability of Nepalese commercial banks. *National Journal of Arts, Commerce and Scientific Research Review* 5(1), 59-64.
- Gazi, M. A. I., M. S. Alam, G. M. Hossain, A. Islam, S. N., Rahman, M. K., Nahiduzzaman, and A. I. Hossain, 2021. Determinants of profitability in banking sector: empirical evidence from Bangladesh. *Universal Journal of Accounting and Finance*, 9(6), 1377-1386.
- Ginting, C., N. M. Putri, H. F. Wardani, R. Nopian, and M. I. Nasution, 2023. The influence of inflation and net profit margins on banking sector stock prices in mediation of profitability on the Indonesian stock exchange for the 2017-2021 Period. *Proceeding Medan International Conference Economics and Business* 1(3), 272-282.
- 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.
- 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.
- Isayas, Y. N., 2022. Determinants of banks' profitability: Empirical evidence from banks in Ethiopia. *Cogent Economics and Finance* 10(1), 1-15.
- Jeevitha, R., B. Mathew, and K. K. Shradha, 2019. "Impact of inflation on banks: A study on selected bank profitability. *Journal of Emerging Technologies and Innovative Research* 6(6), 38-44.
- Jiang, T., and Y. Zheng, (2024). Indicators of non-performing loan: Does efficiency matter? *Technological and Economic Development of Economy* 30(1), 129-147.
- Kenny, A. S., O. O. Jumoke, and O. A. Faderera, 2014. Risk management practices and financial performance: An evidence from the Nigeria Deposit Money Bank. *International Journal of Managerial Studies and Research* 2(5), 31-39.
- Khan, W. A., and A. Sattar, 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.
- Malik, M. F., S. Khan, M. I. Khan, and F. Khan, 2014. Interest rate and its effect on bank's profitability. *J. Appl. Environ. Biol. Sci* 4(8), 225-229.
- Martiningtiyas, C. R., and D. T. Nitinegeri, 2020. The effect of non-performing loans on profitability in banking sector in Indonesia. *Advances in Economics, Business and Management Research* 15(1), 64-66.
- Marwansyah, M., and M. Syarief, 2022. The influence of the capital adequacy ratio, net interest margin, gross domestic product and inflation on the profitability of Islamic banks in the middle of the pandemic COVID-19. *Journal of Economics* 2(5), 12-28.
- Moyo, D., and T. Tursoy, 2020. Impact of inflation and exchange rate on the financial performance of commercial banks in South Africa. *Journal of Applied Economic Sciences* 15(3), 1-25.
- Mujeri, M., and Y. Sayera, 2009. An analysis of interest rate spread in the banking sector of Bangladesh Development Studies. *The Bangladesh Development Studies* 32(4), 1-33.

- Nyabaga, R. M. I., and J. M. Wepukhulu, 2020. Effect of firm characteristics on financial performance of listed commercial banks in Kenya. *International Journal of Economics and Financial Issues* 10(3), 255-262.
- Obidike, P. C., C. EjehGrace, and U. S. Ugochukwu, 2015. The impact of interest rate spread on the performance of Nigerian banking industry. *Journal of Economics and Sustainable Development* 6(3), 131-139.
- Olarewaju, O. M., and J. O. Akande, 2016. An empirical analysis of capital adequacy determinants in Nigerian banking sector. *International Journal of Economics and Finance* 8(12), 132-142.
- Owusu-Antwi, G., R. Banerjee, and J. Antwi, 2017. Interest rate spread on bank profitability: the case of Ghanaian banks. *Journal of Accounting, Business and Finance Research* 1(1), 34-45.
- Pradhan, R. S., and S. Upadhaya, 2018. Impact of financial structure and macro-economic variables on the financial performance of Nepalese commercial banks. *Nepalese Journal of Business* 5(2), 1-14.
- Raharjo, P. G., D. B. Hakim, A. H. Manurung, and T. N. Maulana, 2014. The determinant of commercial banks' interest margin in Indonesia: An analysis of fixed effect panel regression. *International Journal of Economics and Financial Issues* 4(2), 295-308.
- Ramadanti, F., and E. Setyowati, 2022. Pengaruh NPL, LDR, BOPO dan NIM Terhadap ROA Pada PT. Bank Mandiri (Persero) Tbk Tahun 2013-2021. *Jurnal Ilmiah Ekonomi dan Bisnis* 10(12), 2716-4411.
- 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.
- Sari, W., N. A. H. Putri, and D. Apriani, 2023. The influence of capital adequacy ratio, loan to deposit ratio, and net interest margin on return on asset at Bank Jabar Banten. *International Journal of Global Operations Research* 4(2), 95-100.
- Setiariini, D. 2023. The influence of non-performing financing and financing to deposit ratio on profitability with capital adequacy ratio as a mediation variable on Islamic commercial banks in Indonesia. *Journal Islamic Economics* 2(1), 10-23.
- Sinclair, P. 2010. *Inflation Expectations*. New York, NY: Routledge.
- Sinişin, N. 2020. Determinants of Banking Profitability through ROA and ROE: A Panel Data Approach. *Economic Sciences Series* 20(1), 1037-1043.
- Soukhakian, I., and M. Khodakarami, 2019. Working capital management, firm performance and macroeconomic factors: Evidence from Iran. *Cogent Business and Management* 6(1), 1-24.
- 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.
- Terstena, A., G. Deda, S. Todorova, I. Mehemeti, and S. Krasniqi, 2023. The impact of inflation on the profitability of businesses: evidence from Kosovo. *Journal of Educational and Social Research* 13(4), 248-259.
- 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.
- Wulansari, J., and S. Chandra, 2022. Analysis of the influence of bank health level using RGEC method on financial performance (ROA) of the conventional banking sector listed on Bei. *Jurnal Ilmiah Manajemen*, 10(3), 2580-3743.
- Yuan, D., A. I. Md, I. Gazi, B. K. Harymawan, and A. I. Hossain, 2022. Profitability determining factors of banking sector: Panel data analysis of commercial bank in South Asian Countries. *Journal Frontiers in Psychology* 13(3), 1-17.

Chapter 34

Effect of Bank Dynamics, Bank Risks and Macroeconomic Factors on Capital Structure Decisions of Nepalese Commercial Banks

Amrit Kandel*

Abstract

This study examines the effect of bank dynamics, bank risks and macroeconomic factors on capital structure decisions of Nepalese commercial banks. Total debt to total assets ratio and long-term debt to total assets ratio are the selected dependent variables. The selected independent variables are bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth. The study is based on secondary data of 12 commercial banks with 120 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 bank dynamics, bank risks and macroeconomic factors on capital structure decisions of Nepalese commercial banks.

The study showed that bank size has a negative impact on total debt to total assets ratio. It indicates that increase in bank size leads to decrease in total debt to total assets ratio. Likewise, profitability has a negative impact on long term debt to total assets ratio. It indicates that higher the profitability, lower would be the long-term debt to total assets ratio. In addition, deposit ratio has a positive impact on total debt to total assets. It indicates that increase in deposit ratio leads to increase in total debt to total assets ratio. However, deposit ratio has a negative impact on long term debt to total assets ratio. It indicates that higher the deposit ratio, lower would be the long-term debt to total assets ratio. In addition, credit risk has a negative impact on total debt to total assets ratio and long-term debt to total assets ratio. It indicates that increase in credit risk leads to decrease in total debt to total assets ratio and long-term debt to total assets ratio. Moreover, liquidity risk has a negative impact on total debt to total assets ratio and long-term debt to total assets ratio. It indicates that higher the liquidity risk, lower would be the total debt to total assets ratio and long-term debt to total assets ratio.

Keywords: bank size, profitability, deposit, liquidity risk, credit risk, inflation, GDP growth, total debt to total assets ratio, long-term debt to total assets ratio

1. Introduction

Capital structure decisions are crucial for any organization, especially for banking institutions. A well-designed capital structure provides flexibility for the bank to adapt to changing market conditions and regulatory requirements (Modugu, 2013). It allows the organization to raise additional funds when needed and to take advantage of growth opportunities swiftly. Effective capital structure management helps in mitigating financial risks. Too much reliance on debt can increase the risk of bankruptcy, especially during economic downturns when cash flows may be strained. On the other hand, excessive equity financing might lead to lower returns on equity, which could disappoint investors. In essence, an effective capital structure decision is not only about raising funds but also about optimizing financial performance, managing risk, and fostering sustainable growth for banking organizations (Naseem et al., 2017).

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

The banking sector plays an instrumental role in the development of an efficient financial system that fosters economic development. The allocation of economic resources among nations is significantly influenced by banks. They constantly transfer resources from depositors to investors. Banks must be financially sound and lucrative in order to perform mediation services in a sustainable manner (Assfaw, 2019). Banks are subject to more risks and regulations as compared to other industries. Since banks possess more risks as compared to other firms, corporate finance decisions differ from other firms. The capital structure is one such decision that differs from other firms. This is because banks have to obey some rules and laws that protect their financial position against instability. As banks do not enjoy the luxury of choice between loans and equity, instead, they have to rely more on debts in order to avoid violating the minimum capital requirements (Flannery, 1989). Debts are associated with tax-deductible interest payments, which act as a shield against corporate taxes. Similarly, debt is the cheapest source of capital as compared to other sources. Although debt is the cheapest alternative to finance a firm's operations and growth, it comes with the risk of bankruptcy and potential agency problems between stockholders and debt holders (Myers, 1977). Banks' ability to meet their stakeholders' demands is intricately linked to their capital composition. An effective capital structure decision allows a banking organization to progress successfully and achieve progressive growth. Hence, banks must maintain an optimal level of leverage to effectively leverage the value of the enterprise (Salawu, 2007). The biggest reason for business failure is due to the absence of a suitable capital structure decision. Therefore, the adoption of an ideal mix of funding is vital since it reduces the cost of capital of the organization and optimizes its value. Thus, more profitable investment alternatives are available for the firm (Al-Qudah, 2014).

Khan (2022) explored the determinants of bank profitability of Saudi Arabian banks. The study revealed that profitability and size have a negative relationship with the solvency ratio as measured by the total capital-to-assets ratio. However, the study showed that liquidity has a positive relationship with the solvency ratio. Similarly, Ali and Puah (2019) examined the enterprise-specific determinants of bank profitability and stability in Pakistan's banking sector. The study showed that there is a positive relationship between size and bank leverage. However, the study revealed a negative relationship between profitability and bank leverage. Likewise, Mohammad (2021) analyzed how bank capital structure decision-making changed during recessions during COVID-19 in Pakistan. The study revealed that liquidity and profitability have a negative impact on bank leverage. However, the study showed that size has a positive impact on bank leverage. Further, Ayalew (2021) analyzed the capital structure and profitability of private banks in Ethiopia. The study showed that profitability and credit risk have a positive relationship with bank leverage, whereas profitability has a positive relationship with bank leverage. In addition, Doku *et al.* (2019) analyzed the capital structure and bank performance in Ghana. The study found that profitability, deposit and real GDP growth rate have a negative impact on bank leverage. In contrast, size and credit risk have a positive impact on bank leverage. Similarly, Al-Harby (2019) investigated the factors affecting capital structure of conventional and Islamic banks in the MENA region. The study revealed that size, liquidity, and inflation have a positive impact on bank leverage measured by total debt to total assets. However, profitability has a positive impact on bank leverage.

Alraheb *et al.* (2019) examined the institutional environment and bank capital ratios. The study found that profitability, size, and GDP growth rate have a negative impact on bank leverage and capital adequacy ratio. Similarly, Ofori-Sasu *et al.* (2019) revealed that size, GDP growth, and inflation have a positive relationship with bank solvency. Likewise, Sheikh and Qureshi (2017) analysed the determinants of the capital structure of Islamic and conventional banks in Pakistan. The result revealed that size has a positive impact on bank leverage, whereas profitability has a negative impact on bank leverage. Further, Belkhir *et al.* (2016) examined the institutions and corporate capital structure in

the MENA Region. The result showed that size and GDP growth rate have a positive impact on bank leverage, whereas profitability and liquidity have a negative impact on bank leverage. In addition, Gropp and Heider (2010) analysed the determinants of bank capital structure. The result revealed that profitability has a negative impact on bank leverage. However, size and deposit have a positive impact on bank leverage. Similarly, Hamouda *et al.* (2023) analysed the capital structure determinants in the MENA region countries. The study revealed that size, tangibility of assets, and private credit have a positive influence on firm's capital structure, whereas profitability, growth prospects, and GDP growth rate have a negative impact on firm's capital structure. Likewise, Obadire *et al.* (2023) examined the factors affecting bank capital structure in Africa. The study found that profit, bank size and liquidity have a negative impact on bank solvency ratio. Further, Kim *et al.* (2023) analysed how capital structure and bank liquidity affect bank performance. The study revealed that liquidity has a negative relationship with total debt-to-assets ratio. In addition, Guizani and Ajmi (2021) analysed the capital structure decisions of Islamic and conventional banks in Malaysia. The study showed that profitability, liquidity, and GDP growth rate have a negative impact on leverage, whereas size has a positive impact on the leverage of conventional banks.

Castro and Lopes (2021) examined the capital structure determinants of the Portuguese banking sector. The study demonstrated that profitability has a negative impact on bank leverage. However, bank size has a positive impact on bank leverage. Similarly, Erulgen *et al.* (2020) analysed the bank characteristics' effect on capital structure in North Cyprus. The study revealed that size and Credit risks have a positive impact on equity to assets. Likewise, Yuan *et al.* (2022) investigated the profitability determining factors of the banking sector using panel data analysis of commercial banks in South Asian countries. The result showed that there is a positive relationship between deposit and bank leverage. Further, Homaidi *et al.* (2018) found that there is a negative relationship between deposit and bank leverage. In addition, Pham *et al.* (2022) analysed the impact of capital structure on bank profitability in Vietnam. The study revealed that GDP growth rate and deposit ratio have a negative relationship with long-term debt-to-assets ratio, whereas inflation has a negative relationship with the long-term debt-to-assets ratio. In addition, Lamothe *et al.* (2024) analyzed the bank profitability factors. The study showed that there is no significant relationship between the deposit ratio and solvency ratio measured by the equity-to-assets ratio. Moreover, De Bandt *et al.* (2021) investigated the determinants of banks' liquidity from the French perspective on interactions between market and regulatory requirements. The study revealed that positive correlation between liquidity and solvency ratio, measured by capital adequacy ratio.

In the context of Nepal, Chalise (2021) analysed how the capital structure debt, equity, and assets relate to the profitability of commercial banks in Nepal. The study found that size and profitability have a negative relationship with the debt-to-equity ratio. Similarly, Timilsina (2020) examined the bank-specific factors influencing the capital structure of Nepalese commercial banks. The study concluded that profitability and liquidity have a negative impact on bank leverage. Likewise, Bhatt and Jain (2020) assessed the relationship between capital structure and the profitability of commercial Banks in Nepal. The study revealed that size, profitability, and growth have no significant relationship with short-term, long term and total debt to total assets ratios. Further, Pradhan and Khadka (2017) analysed the enterprise-specific and macroeconomic factors of capital structure in Nepalese commercial banks. The study revealed that there is a positive but an insignificant relationship between macroeconomic factors and capital structure. In addition, Adhikari *et al.* (2016) examined the capital structure determinants mechanism viz. tax shield, asset structure, profitability, size, and growth on the performance of banking business in Nepal. The study revealed that there is no significant impact of size, profitability, debt tax shields, and growth on long-term and total leverage ratio.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of bank dynamics, bank risks and macroeconomic factors on capital structure decisions 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 effect of bank dynamics, bank risks and macroeconomic factors on capital structure decisions of Nepalese commercial banks. Specifically, it examines the relationship of bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth with capital structure decisions 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 2013/14 to 2022/23, leading to a total of 120 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
Public bank			
1.	Nepal Bank Limited	2013/14-2022/23	10
2.	Agricultural Development Bank Limited	2013/14-2022/23	10
Joint venture banks			
3.	Everest Bank Limited	2013/14-2022/23	10
4.	NMB Bank Limited	2013/14-2022/23	10
5.	Nepal SBI Bank Limited	2013/14-2022/23	10
6.	Standard Chartered Bank Limited	2013/14-2022/23	10
Private banks			
7.	Machhapuchchhre Bank Limited	2013/14-2022/23	10
8.	Sanima Bank Limited	2013/14-2022/23	10
9.	Citizens International Bank Limited	2013/14-2022/23	10
10.	Prime Commercial Bank Limited	2013/14-2022/23	10
11.	Siddhartha Bank Limited	2013/14-2022/23	10
12.	NIC Asia Bank Limited	2013/14-2022/23	10
Total number of observations			120

Thus, the study is based on the 120 observations.

The model

The model used in this study assumes that capital structure decisions depend upon bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth. The dependent variables selected for the study are total debt to total assets ratio and long-term debt to total assets ratio. Similarly, the selected independent variables are bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth. Therefore, the models take the following forms:

$$TDTA = \beta_0 + \beta_1 BSIZE + \beta_2 PROF + \beta_3 DEP + \beta_4 CR + \beta_5 LIQ + \beta_6 GDR + \beta_7 INF + e_{it}$$

$$LTDA = \beta_0 + \beta_1 BSIZE + \beta_2 PROF + \beta_3 DEP + \beta_4 CR + \beta_5 LIQ + \beta_6 GDR + \beta_7 INF + e_{it}$$

Where,

TDTA = Total debt to total assets ratio as measured by the ratio of total debt to total assets, in percentage.

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

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

PROF = Profitability as measured by the ratio of net income to total assets, in percentage.

DEP = Deposit ratio as measured by total deposit to total assets ratio, in percentage.

CR = Credit risk as measured by the ratio of non-performing loans to total loans, in percent.

LIQ = Liquidity risk as measured by the ratio of liquid assets to total deposits, in percentage.

GDR = GDP growth rate, in percentage.

INF = Inflation as measured by the change in Consumer Price Index (CPI), in percentage.

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

Bank size

Larger banks typically have more access to capital markets, allowing them to raise funds more easily through debt issuance. This increased access to external financing can lead to a higher debt ratio. Mohammad (2021) showed that bank size has a positive effect on bank leverage. Ayalew (2021) observed a significant relationship between bank size and bank leverage. Larger banks may benefit from economies of scale, which can lead to lower average costs of funding. This can incentivize them to take on more debt to finance their operations. Similarly, Ali and Pua (2019) found a positive relationship between bank size and leverage. Doku *et al.* (2019) showed that bank size has a positive effect on bank leverage. Al-Harby (2019) revealed that bank size has a positive effect on bank leverage. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between bank size and the capital structure of banks.

Profitability

Frank and Goyal (2009) showed a positive link between leverage and profitability. Trade-

off theory predicts that companies with positive earnings before taxes should aim for larger leverage ratios to benefit from tax shielding. Hence, it anticipates a positive association between leverage and profitability. Profitable banks generate more internal funds through their operations. They can use these funds to finance their activities without relying as heavily on external debt. Therefore, higher profitability can lead to a lower need for debt financing, resulting in a lower debt ratio. However, Hamouda *et al.* (2023) showed that profitability has a negative effect on bank leverage. Similarly, Obadire *et al.* (2023) revealed that profitability has a negative association with bank leverage. Profitable banks are generally perceived as less risky by investors and lenders. This perception can give them better access to equity financing and lower borrowing costs for debt financing. As a result, they may prefer to raise funds through equity rather than debt, leading to a lower debt ratio. Likewise, Kim *et al.* (2023) observed a negative relationship between the profitability and the bank solvency ratio. Further, Guizani and Ajmi (2021) concluded that profitability has a negative effect on bank leverage. Based on it, this study develops the following hypothesis:

H₂: There is a negative relationship between profitability and capital structure of banks.

Deposit

Banks with higher deposit ratios may be perceived as less risky by investors and regulators because they have a more stable funding base. This stability can reflect positively on the bank's risk management practices, potentially leading to higher solvency ratios. Lamothe *et al.* (2024) revealed that there is a positive relationship between the deposit ratio and the solvency ratio. Similarly, Yuan *et al.* (2022) concluded that there is a positive relationship between deposit and bank leverage. Furthermore, Doku *et al.* (2019) showed a positive relationship between deposits and bank leverage. The study also revealed that excessive reliance on deposits may pose liquidity risks if the bank faces sudden deposit withdrawals or changes in market conditions. Therefore, while a high deposit ratio can contribute to solvency, banks must maintain a balance between deposit funding and other sources of funding to ensure overall financial stability. Moreover, Almaqtari *et al.* (2018) found that deposit has a positive relationship with bank leverage. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between deposits and capital structure of banks.

Credit risk

Akhter (2023) analyzed the determinants of commercial bank's credit risks in Bangladesh. The study found that credit risk has a positive relationship with the bank capital structure. The quality of a bank's assets, particularly its loan portfolio, is a crucial determinant of its solvency. Higher credit risk in the loan portfolio indicates lower asset quality, which can lead to higher loan loss provisions and impairments. This, in turn, can reduce the bank's capital adequacy and solvency ratios. Similarly, Msomi (2022) revealed that credit risk has a positive relationship with the solvency ratio. Almaskati (2022) observed a positive relationship between loan-performing loans and solvency ratios. Higher credit risk implies a greater likelihood of borrowers defaulting on their loans. If a bank's loan portfolio is riskier, it increases the likelihood of loan defaults, which can erode the bank's capital base. This can lead to a decrease in the solvency ratio. Furthermore, Adelopo *et al.* (2021) found that credit risk has a positive relationship with the solvency ratio. Based on it, this study develops the following hypothesis:

H₄: There is a positive relationship between credit risk and capital structure of banks.

Liquidity risk

According to Kim *et al.* (2023), liquidity is defined as how cash equivalents and other assets

can be easily changed into cash. The liquidity ratio can evaluate the firm's ability to pay off its short-term debt obligation. In the case, of the banking sector, liquidity has to meet the regulatory requirements. Pham *et al.* (2022) analyzed the impact of capital structure on bank profitability in Vietnam. The study revealed that liquidity has a negative relationship with bank leverage. Similarly, Ha *et al.* (2022) found that liquidity has a negative relationship with the solvency ratio. Likewise, Dang and Bao (2020) concluded that liquidity has a negative relationship with bank leverage. Moreover, Zafar *et al.* (2019) showed that liquidity has a negative relationship with bank leverage. Likewise, Almaqtari *et al.* (2018) observed a negative relationship between liquidity and bank leverage. Based on it, this study develops the following hypothesis:

H₅: There is a negative relationship between credit risk and the capital structure of 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. Interest rates play a major role in capital structure decisions (Melaku, 2020). Dang and Bao (2020) analyzed the monetary policy, bank leverage and liquidity. The study found that inflation has a negative effect on bank leverage. Similarly, Khan *et al.* (2022) found that inflation has a negative effect on bank leverage. Likewise, Hoque and Pour (2018) revealed that inflation has a negative effect on bank leverage. Furthermore, Yuksel *et al.* (2018) showed that inflation has a negative relationship with the solvency ratio. In addition, Abdul-Rahman *et al.* (2018) concluded that inflation has a negative relationship with capital adequacy ratio. Moreover, Anarfo (2015) showed that inflation has a negative impact on the total debt to total assets ratio. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between inflation and capital structure of banks.

GDP growth rate

Kwashie *et al.* (2022) investigated the impact of credit risk on the financial performance of commercial banks in Ghana. The study revealed that GDP growth rate has a positive relationship with the solvency ratio. Similarly, Akhter (2023) showed that GDP growth rate has a positive effect on the solvency ratio. Likewise, Twum *et al.* (2020) examined the impact of internal and external factors of credit risk on businesses in the context of Chinese commercial banks. The study found a positive relationship of GDP growth rate with solvency ratio. Moreover, Almaqtari *et al.* (2018) concluded that GDP growth rate has a positive relationship with the solvency ratio. Similarly, Hoque and Pour (2018) revealed that GDP growth rate has a positive effect on bank leverage. Based on it, this study develops the following hypothesis:

H₇: There is a positive relationship between the GDP growth rate and capital structure 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 12 Nepalese commercial banks for the

study period of 2013/14 to 2022/23. The dependent variables are TDTA (Total debt to total assets as measured by the ratio of total debt to total assets, in percentage) and LTDA (Long-term debt to total assets as measured by the ratio of long-term debt to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by the natural logarithm of total assets, Rs. in billion), PROF (Profitability as measured by the ratio of net income to total assets, in percentage), DEP (Deposit ratio as measured by deposit to total assets ratio, in percentage), CR (Credit risk as measured by the ratio of non-performing loans to total loans, in percent), LIQ (Liquidity risk as measured by the ratio of liquid assets to total deposits, in percentage), GDR (GDP growth rate, in percentage), GDR (GDP growth rate, in percentage) and INF (Inflation as measured by the change in Consumer Price Index (CPI), in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
TDTA	0.64	0.97	0.85	0.07
LTDA	0.01	0.08	0.01	0.02
BSIZE	10.29	12.85	11.64	0.61
PROF	0.01	0.08	0.02	0.01
DEP	0.64	0.98	0.81	0.06
LIQ	20.1	57.44	28.83	7.18
CR	0.01	5.82	1.43	1.16
INF	3.6	9.94	6.19	2.00
RGDP	-2.37	8.98	4.76	3.23

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 2013/14 to 2022/23. The dependent variables are TDTA (Total debt to total assets as measured by the ratio of total debt to total assets, in percentage) and LTDA (Long-term debt to total assets as measured by the ratio of long-term debt to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by the natural logarithm of total assets, Rs. in billion), PROF (Profitability as measured by the ratio of net income to total assets, in percentage), DEP (Deposit ratio as measured by deposit to total assets ratio, in percentage), CR (Credit risk as measured by the ratio of non-performing loans to total loans, in percent), LIQ (Liquidity risk as measured by the ratio of liquid assets to total deposits, in percentage), GDR (GDP growth rate, in percentage), GDR (GDP growth rate, in percentage) and INF (Inflation as measured by the change in Consumer Price Index (CPI), in percentage).

Variables	TDTA	LTDA	BSIZE	PROF	DEP	CR	LIQ	INF	RGDP
TDTA	1								
LTDA	-0.114	1							
BSIZE	-0.610**	0.529**	1						
PROF	0.301**	-0.162	-0.314**	1					
DEP	0.745**	-0.215**	0.189*	0.273**	1				
CR	-0.155	-0.183*	0.073	-0.074	0.011	1			
LIQ	-0.134	-0.109	0.07	0.168	-0.139	-0.011	1		
INF	0.393**	-0.073	-0.458	0.138	0.438	0.142	0.034	1	
RGDP	-0.003	-0.062	-0.027	0.011	-0.182**	0.094	-0.023	-0.456	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 negative relationship with total debt to total assets. It indicates that increase in bank size leads to decrease in total debt to total assets. Similarly, there is a positive relationship between profitability and total debt to total assets. It indicates that increase in profitability leads to increase in total debt to total assets. Likewise, there is a positive relationship between deposit ratio and total debt to total assets. It indicates that increase in deposit ratio leads to increase in total debt to total assets. In contrast, credit risk has a negative relationship with total debt to total assets. It indicates that higher the credit risk, lower would be the total debt to total assets. In addition, liquidity has a negative relationship with total debt to total assets. It indicates that increase in liquidity leads to decrease in total debt to total assets. Moreover, inflation has a positive relationship with total debt to total assets. It indicates that higher the inflation, higher would be the total debt to total assets. However, gross domestic product has a negative relationship with total debt to total assets. It indicates that higher the gross domestic product, lower would be the total debt to total assets.

Similarly, the result also shows that bank size has a positive relationship with long-term debt to total assets. It indicates that increase in bank size leads to increase in long-term debt to total assets. Similarly, there is a negative relationship between profitability and long-term debt to total assets. It indicates that increase in profitability leads to decrease in long-term debt to total assets. Likewise, there is a negative relationship between deposit ratio and long-term debt to total assets. It indicates that increase in deposit ratio leads to decrease in long-term debt to total assets. In contrast, credit risk has a negative relationship with long-term debt to total assets. It indicates that higher the credit risk, higher would be the long-term debt to total assets. In addition, liquidity has a negative relationship with long-term debt to total assets. It indicates that increase in liquidity leads to decrease in long-term debt to total assets. Moreover, inflation has a negative relationship with long-term debt to total assets. It indicates that higher the inflation, lower would be the long-term debt to total assets. However, gross domestic product has a negative relationship with long-term debt to total assets. It indicates that higher the gross domestic product, lower would be the long-term debt to total assets.

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 bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth with total debt to total assets of Nepalese commercial banks.

Table 4

Estimated regression results of bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth with total debt to total assets

The results are based on panel data of 12 commercial banks with 120 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $TDTA = \beta_0 + \beta_1 BSIZE + \beta_2 PROF + \beta_3 DEP + \beta_4 CR + \beta_5 LIQ + \beta_6 GDR + \beta_7 INF + e_{it}$ where, the dependent variable is TDTA (Total debt to total assets as measured by the ratio of total debt to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by the natural logarithm of total assets, Rs. in billion), PROF (Profitability as measured by the ratio of net income to total assets, in percentage), DEP (Deposit ratio as measured by deposit to total assets ratio, in percentage), CR (Credit risk as measured by the ratio of non-performing loans to total loans, in percent), LIQ (Liquidity risk as measured by the ratio of liquid assets to total deposits, in percentage), GDR (GDP growth rate, in percentage), GDR (GDP growth rate, in percentage) and INF (Inflation as measured by the change in Consumer Price Index (CPI), in percentage).

Model	Intercept	Regression coefficients of							Adj. R _{bar} ²	SEE	F-value
		BSize	PROF	DEP	CR	LIQ	INF	RGDP			
1	1.613 (17.476)**	-0.610 (8.326)**							0.367	0.535	69.924
2	0.814 (64.04)**		0.298 (3.387)**						0.081	0.064	11.471
3	0.814 (64.04)**			0.744 (12.086)**					0.549	0.045	146.066
4	0.865 (89.447)**				-0.155 (1.705)				0.016	0.067	2.908
5	0.888 (35.003)**					-0.134 (1.468)			0.010	0.067	2.154
6	0.77 (41.743)**						0.393 (4.642)**		0.147	0.062	21.544
7	0.852 (77.418)**							-0.003 (0.038)	0.003	0.067	0.001
8	0.852 (77.418)**	-0.573 (7.479)**	0.121 (1.575)						0.376	0.053	0.053
9	1.485 (14.964)**	-0.553 (7.546)**	0.012 (0.143)	0.281 (3.514)**					0.431	0.051	30.841
10	1.489 (14.909)**	-0.552 (7.501)**	0.008 (0.102)	0.269 (3.231)**	-0.037 (0.513)				0.428	0.051	23.048
11	1.491 (15.197)**	-0.529 (7.237)**	0.012 (0.141)	0.299 (3.604)	-0.031 (0.437)	-0.160 (2.253)*			0.447	0.05	20.113
12	1.492 (14.765)**	-0.529 (7.115)**	0.012 (0.141)	0.299 (3.581)**	-0.031 (0.434)	-0.161 (2.243)*	0.001 (0.021)		0.443	0.05	16.613
13	1.489 (14.005)**	-0.527 (6.623)**	0.011 (0.137)	0.299 (3.551)**	-0.03 (0.418)	-0.162 (2.225)*	0.013 (0.061)	-0.015 (0.071)	0.438	0.05	14.114

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.
- Total debt to total assets is the dependent variable.

Table 4 shows that the beta coefficients for bank size are negative with total debt to total assets. It indicates that bank size has a negative impact on total debt to total assets. This finding is consistent with the findings of Ayalew (2021). Similarly, the beta coefficients for profitability are positive with total debt to total assets. It indicates that profitability has a positive impact on total debt to total assets. This finding is similar to the findings of Hamouda *et al.* (2023). Likewise, the beta coefficients for deposit ratio are positive with total debt to total assets. It indicates that deposit ratio has a positive impact on total debt to total assets. This finding is consistent with the findings of Lamothe *et al.* (2024). In addition, the beta coefficients for credit risk are negative with total debt to total assets. It indicates that credit risk has a negative impact on total debt to total assets. This finding is consistent with the findings of Adelopo *et al.* (2021). Further, the beta coefficients for liquidity are negative with total debt to total assets. It indicates that liquidity has a negative impact on total debt to total assets. This finding is similar to the findings of Almaqtari *et al.* (2018). Moreover, the beta coefficients for inflation are positive with total debt to total assets. It indicates that inflation has a positive impact on total debt to total assets. This finding is not similar to the findings of Hoque and Pour (2018). In contrast, the beta coefficients for gross domestic product are negative with total debt to total assets. It indicates that gross domestic product has a negative impact on total debt to total assets. This finding is similar to the findings of Twum *et al.* (2020).

Table 5 presents the regression results of bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth with long-term debt to total assets of Nepalese commercial banks.

Table 5

Estimated regression results of bank size, profitability, deposit, liquidity risk, credit risk, inflation, and GDP growth with long-term debt to total assets

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 $LTDA = \beta_0 + \beta_1 BSIZE + \beta_2 PROF + \beta_3 DEP + \beta_4 CR + \beta_5 LIQ + \beta_6 GDR + \beta_7 INF + e_i$ where, the dependent variable is LTDA (Long-term debt to total assets as measured by the ratio of long-term debt to total assets, in percentage). The independent variables are BSIZE (Bank size as measured by the natural logarithm of total assets, Rs. in billion), PROF (Profitability as measured by the ratio of net income to total assets, in percentage), DEP (Deposit ratio as measured by deposit to total assets ratio, in percentage), CR (Credit risk as measured by the ratio of non-performing loans to total loans, in percent), LIQ (Liquidity risk as measured by the ratio of liquid assets to total deposits, in percentage), GDR (GDP growth rate, in percentage), GDR (GDP growth rate, in percentage) and INF (Inflation as measured by the change in Consumer Price Index (CPI), in percentage).

Model	Intercept	Regression coefficients of							Adj. R_bar ²	SEE	F-value
		BSIZE	PROF	DEP	CR	LIQ	INF	RGDP			
1	-0.142 (6.151)**	0.529 (6.763)**							0.273	0.013	45.737
2	0.019 (6.159)**		0.161 (1.773)						0.018	0.015	3.142
3	0.056 (3.178)**			0.216 (2.401)*					0.038	0.015	5.76
4	0.010 (4.693)**				-0.183 (2.022)*				0.025	0.015	4.09
5	0.021 (3.521)**					-0.109 (1.188)			0.003	0.015	1.411
6	0.017 (7.64)**						0.073 (0.791)		0.005	0.016	0.626
7	0.015 (6.047)**							-0.062 (0.678)	0.004	0.016	0.459
8	-0.143 (5.641)**	0.530 (6.414)**	0.005 (0.065)						0.267	0.013	22.678
9	-0.211 (4.733)**	0.639 (6.333)**	0.01 (0.126)	0.184 (1.845)					0.282	0.013	16.564
10	-0.225 (5.088)**	0.651 (6.554)**	0.004 (0.047)	0.221 (2.222)*	-0.174 (2.242)*				0.306	0.013	14.111
11	-0.214 (5.814)**	0.655 (6.634)**	0.025 (0.309)	0.142 (1.382)	-0.170 (2.207)*	-0.129 (1.649)			0.316	0.013	12.001
12	-0.224 (6.068)**	0.705 (6.966)**	0.033 (0.401)	0.142 (1.382)	-0.133 (1.691)	-0.148 (1.889)	0.169 (1.882)		0.331	0.013	10.815
13	-0.237 (4.963)**	0.730 (6.782)**	0.031 (0.384)	0.151 (1.452)	-0.133 (1.691)	-0.121 (1.499)	0.208 (1.966)*	-0.064 (0.701)	0.328	0.013	9.298

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.
- Long-term debt to total assets is the dependent variable.

Table 5 shows that the beta coefficients for bank size are positive with long-term debt to total assets. It indicates that bank size has a positive impact on long-term debt to total assets. This finding is similar to the findings of Ali and Puah (2019). Similarly, the beta coefficients for profitability are positive with long-term debt to total assets. It indicates that profitability has a positive impact on long-term debt to total assets. This finding is inconsistent with the findings of Guizani and Ajmi (2021). Likewise, the beta coefficients for deposit ratio are positive with long-term debt to total assets. It indicates that deposit ratio has a positive impact on long-term debt to total assets. This finding is consistent with the findings of Doku *et al.* (2019). In addition, the beta coefficients for credit risk are negative with long-term debt to total assets. It indicates that credit risk has a negative impact on long-term debt to total assets. This finding contradicts with the findings of Hamouda *et al.* (2023). Further, the beta coefficients for liquidity are negative with long-term debt to total assets. It indicates that liquidity has a negative impact on long-term debt to total assets. This finding is similar to the findings of Akhter (2023). Moreover, the beta coefficients for inflation are positive with long-term debt to total assets. It indicates that inflation has a positive impact on long-term debt to total assets. This finding is inconsistent with the findings of Khan *et al.* (2022). In contrast, the beta coefficients for gross domestic product are negative with long-term debt to total assets. It indicates that gross domestic product has a

negative impact on long-term debt to total assets. This finding contradicts with the findings of Kwashie *et al.* (2022).

4. Summary and conclusion

The banking sector plays an instrumental role in the development of an efficient financial system that fosters economic development. The allocation of economic resources among nations is significantly influenced by banks. They constantly transfer resources from depositors to investors. Banks must be financially sound and lucrative in order to perform mediation services in a sustainable manner. Banks are subject to more risks and regulations as compared to other industries. Since banks possess more risks as compared to other firms, corporate finance decisions differ from other firms, the capital structure is one such decision that differs from other firms. This is because banks have to obey some rules and laws that protect their financial position against instability. As banks do not enjoy the luxury of choice between loans and equity, instead, they have to rely more on debts in order to avoid violating the minimum capital requirements. Capital structure is the combination of various sources of capital that fund its balance sheet, which represents the combination of sources of funds such as debt, equity, and preferred stocks. Debts are associated with tax-deductible interest payments, which act as a shield against corporate taxes. Similarly, debt is the cheapest source of capital as compared to other sources. Although debt is the cheapest alternative to finance a firm's operations and growth, it comes with the risk of bankruptcy and potential agency problems between stockholders and debt holders.

This study attempts to analyze the effect of bank dynamics, bank risks and macroeconomic factors on capital structure decisions of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 120 observations for the period from 2013/14 to 2022/23.

The major conclusion of this study is that credit risks, liquidity, and gross domestic product have negative impact on total debt to total assets and long-term debt to total assets. It indicates that increase in credit risks, liquidity, and gross domestic product leads to decrease in total debt to total assets and long-term debt to total assets. Similarly, profitability, deposit ratio, and inflation have positive impact on total debt to total assets and long-term debt to total assets. It indicates that increase in profitability, deposit ratio, and inflation leads to increase in total debt to total assets and long-term debt to total assets. Likewise, the study also concluded that deposit ratio followed by inflation is the most influencing factor that explains the changes in the total debt to total assets in the context of Nepalese commercial banks. Similarly, the study also concluded that bank size followed by deposit ratio is the most influencing factor that explains the changes in long-term debt to total assets in the context of Nepalese commercial banks.

References

- Abdul-Rahman, A., A. A. Sulaiman, and N. L. H. M. Said, 2018. Does financing structure affects bank liquidity risk? *Pacific-Basin Finance Journal* 52(6), 26-39.
- Adelopo, I., N. Vichou, and K. Y. Cheung, 2021. Capital, liquidity, and profitability in European banks. *Journal of Corporate Accounting and Finance* 33(1), 23-35.
- Adhikari, N., P. Pandey, P. Thapa, and P. Bhandari, 2016. Capital structure and its determinants: Evidence from. *Nepalese Journal of Business* 3(1), 46-58.
- Akhter, N., 2023. Determinants of commercial bank's non-performing loans in Bangladesh: Empirical evidence. *Finance Cogent Economics and Finance* 11(1), 98-124
- Al-Harby, A., 2019. Factors affecting capital structure of conventional and Islamic banks: Evidence from

MENA region. *Global Review of Islamic Economics and Business* 7(2), 59-69.

- Ali, M., and C. H. Puah, 2019. The internal determinants of bank profitability and stability. *Management Research Review* 42(1), 49-67.
- Almaqtari, F. A., E. A. A. Homaidi, M. I. Tabash, and N. H. Farhan, 2018. The determinants of profitability of Indian commercial banks: A panel data approach. *International Journal of Finance and Economics* 24(1), 168-185.
- Almaskati, N., 2022. The determinants of bank profitability and risk: A random forest approach. *Cogent Economics and Finance* 10(1), 128-142.
- Al-Qudah, A. M., 2014. The determinants of capital structure of listed banks in Jordan: Panel data analysis. *International Journal of Economics and Business Research* 8(1), 36-49.
- Alraheb, T., C. Nicolas, and A. Tarazi, 2019. Institutional environment and bank capital ratios. *Journal of Financial Stability* 43(5), 1-24.
- Anarfo, E. B., 2015. Determinants of capital structure of banks: Evidence from Sub-Sahara Africa. *Asian Economic and Financial Review* 5(4), 624-640.
- Assfaw, A. M., 2019. The determinants of capital structure in Ethiopian private commercial banks: A Panel Data Approach. *Journal of Economics, Business, and Accountancy Ventura* 23(1), 22-43.
- Ayalew, A., 2021. Capital structure and profitability: Panel data evidence of private banks in Ethiopia. *Cogent Economics and Finance* 9(1), 55-67.
- Belkhir, M., A. Maghyreh, and B. Awartani, 2016. Institutions and corporate capital structure in the MENA region. *Emerging Markets Review* 26(7), 99-129.
- Bhatt, S., and S. Jain, 2020. Capital structure and profitability of commercial banks in Nepal. *Journal of Account and Financial Management* 5(5), 2165-2173.
- Castro, N., and I. T. Lopes, 2021. The capital structure determinants of the Portuguese banking sector: A regional dynamics. *Journal of International Studies* 14(3), 124-137.
- Chalise, D. R., 2021. Impact of capital structure on profitability in Nepalese commercial banks. *Trans Asian Journal of Marketing and Management Research* 10(12), 15-28.
- Dang, V. D., and N. K. Q. Bao, 2020. Monetary policy, bank leverage and liquidity. *International Journal of Managerial Finance* 17(4), 619-639.
- De Bandt, O., S. Lecarpentier, and C. Pouvelle, 2021. Determinants of banks' liquidity: A French perspective on interactions between market and regulatory requirements. *Journal of Banking and Finance* 124(1), 106-132.
- Doku, J. N., F. A. Kpekpena, and P. Y. Boateng, 2019. Capital structure and bank performance: Empirical evidence from Ghana. *African Development Review* 31(1), 150-27.
- Erulgen, A., H. Rjoub, and A. Adalier, 2020. Bank characteristics effect on capital structure: Evidence from PMG and CS-ARDL. *Journal of Risk and Financial Management* 13(12), 310-321.
- Flannery, M. J., 1989. Capital regulation and insured banks choice of individual loan default risks. *Journal of Monetary Economics* 24(2), 235-258.
- Frank, M. Z., and V. K. Goyal, 2009. Capital structure decisions: Which factors are reliably important? *Journal of Financial Management* 38(1), 1-37.

- Gropp, R., and F. Heider, 2010. The determinants of bank capital structure. *European Finance Review* 14(4), 587-622.
- Guizani, M., and A. N. Ajmi, 2021. The capital structure decision of Islamic and conventional banks: empirical evidence from Malaysia. *Asia-pacific Journal of Business Administration* 13(2), 216-234.
- Ha, D. T., H. T. T. Hang, T. T. Huy, and N. T. K. Phung, 2022. Factors affecting liquidity of commercial banks in Vietnam. *Proceedings on Engineering Sciences* 4(2), 115-124.
- Hamouda, R. Z. B., N. Hamzaoui, and F. Jilani, 2023. Capital structure determinants: new evidence from the Mena region countries. *International Journal of Economics and Financial Issues* 13(1), 144-163.
- Homaidi, E. A. 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.
- Hoque, H., and E. K. Pour, 2018. Bank-level and country-level determinants of bank capital structure and funding sources. *International Journal of Finance and Economics* 23(4), 504-532.
- Khan, S., 2022. Determinants of operational efficiency: The case of Saudi Banks. *Financial Internet Quarterly* 18(3), 11-20.
- Kim, O. T. T., D. Van Nguyen, H. V. Le, and K. D. Duong, 2023. How capital structure and bank liquidity affect bank performance: Evidence from the Bayesian approach. *Cogent Economics and Finance* 11(2), 122-148.
- 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), 145-163.
- Lamothe, P., E. A. F. Delgado, M. A. Solano, and S. Fernández, 2024. A global analysis of bank profitability factors. *Humanities and Social Sciences Communications* 11(1), 111-133.
- Melaku, W. E., 2020. Determinants of Inflation in Africa: A Systematic review. *International Journal of Management and Fuzzy Systems* 6(4), 59-69.
- Modugu, K. P., 2013. Capital structure decision: An overview. *Journal of Finance and Bank Management* 1(1), 14-27.
- Mohammad, K. U., 2021. How bank capital structure decision-making change in recessions: Covid-19 evidence from Pakistan. *Asian Journal of Economics and Banking* 6(2), 255-269.
- Msomi, T. S., 2022. Factors affecting non-performing loans in commercial banks of selected West African countries. *Banks and Bank Systems* 17(1), 1-12.
- Myers, S. C., 1977. Determinants of corporate borrowing. *Journal of Financial Economics* 5(2), 147-175.
- Naseem, M. A., H. Zhang, F. Malik, and R. Ur-Rehman, 2017. Capital structure and corporate governance. *The Journal of Developing Areas* 51(1), 33-47.
- Obadire, A. M., V. Moyo, and N. F. Munzhelele, 2022. The determinant of African banks' capital structure: Basel III Accord or bank-specific factors? *Journal of Economic and Financial Sciences* 15(1), 123-144.
- Ofori-Sasu, D., J. Y. Abor, and L. Mensah, 2019. Funding structure and technical efficiency. *International Journal of Managerial Finance* 15(4), 425-443.
- Pham, N. H., T. M. Hoang, and N. T. H. Pham, 2022. The impact of capital structure on bank profitability: Evidence from Vietnam. *Cogent Business and Management* 9(1), 22-45.

- Pradhan, R. S., and N. Khadka, 2017. The effect of debt financing on profitability of Nepalese commercial banks. *Social Science Research Network* 27(5), 347-61.
- Salawu, R. O., 2007. An empirical analysis of the capital structure of selected quoted companies in Nigeria. *The International Journal of Applied Economics and Finance* 1(1), 16-28.
- Sheikh, N. A., and M. A. Qureshi, 2017. Determinants of capital structure of Islamic and conventional commercial banks. *International Journal of Islamic and Middle Eastern Finance and Management* 10(1), 24-41.
- Timilsina, L. P., 2020. Determinants of capital structure in Nepalese commercial banks. *Nepalese Journal of Management Review* 1(1), 50-70.
- Twum, A. K., T. Zhongming, A. O. Agyemang, E. C. Ayamba, and R. Chibisah, 2020. The impact of internal and external factors of credit risk on businesses: An empirical study of Chinese commercial banks. *Journal of Corporate Accounting and Finance* 32(1), 115-128.
- Yuan, D., M. A. I. Gazi, I. Harymawan, B. K. Dhar, and A. I. Hossain, 2022. Profitability determining factors of banking sector: Panel data analysis of commercial banks in South Asian countries. *Frontiers in Psychology* 13(4), 115-129.
- Yuksel, S., S. Mukhtarov, E. Mammadov, and M. Özsarı, 2018. Determinants of profitability in the banking sector: An analysis of post-Soviet countries. *Economies* 6(3), 41-48.
- Zafar, Q., W. Wongsurawat, and D. Camino, 2019. The determinants of leverage decisions: Evidence from Asian emerging markets. *Cogent Economics and Finance* 7(1), 159-183.

Chapter 35

Impact of Interest Rate, Monetary Policy, Liquidity and Non- Interest Income on Loans and Deposits of Nepalese Commercial Banks

Astha KC*

Abstract

The study examines the impact of interest rate, monetary policy, liquidity and non-interest income on loans and deposits of Nepalese commercial banks. The dependent variables selected for the study are loan to deposit ratio and loan to asset ratio. The selected independent variables are capital adequacy ratio, non- performing loan, liquidity, cash reserve ratio, non-interest income and interest rate. The study is based on secondary data of 11 commercial banks with 110 observations for the study period from 2013/14 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, publications and websites of 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, monetary policy, liquidity and non- interest income on loans and deposits of Nepalese commercial banks.

The study showed that capital adequacy ratio has a negative effect on loan to deposit ratio and loan to asset ratio. It means that increase in capital adequacy ratio leads to decrease in loan to deposit ratio and loan to asset ratio. Similarly, non-performing loan has a negative effect on loan to deposit ratio and loan to asset ratio. It means that increase in non-performing loan leads to decrease in loan to deposit ratio and loan to asset ratio. In addition, liquidity has a negative effect on loan to deposit ratio and loan to asset ratio. It indicates that increase in liquidity leads to decrease in loan to deposit and loan to asset ratio. In contrast, cash reserve ratio has a positive effect on loan to deposit ratio and loan to asset ratio. It indicates that increase in cash reserve ratio leads to increase in loan to deposit ratio and loan to asset ratio. Likewise, non- interest income has a negative impact on loan to deposit. It indicates that higher the non- interest income, lower would be the loan to deposit ratio.

Keywords: Interest rate, cash reserve ratio, capital adequacy ratio, non- performing loan, liquidity, non- interest income, loan to asset ratio, loan to deposit ratio

1. Introduction

Banking institutions are business entities dedicated to financial intermediation, involving the allocation of surplus liquidity among different economic agents. They use deposits and other liabilities from people or firms with a surplus of resources, redirecting them to economic agents who lack such resources, in the form of loans and other assets. The economy has been driven mostly by commercial banks, as seen by the remarkable increase in lending to the private sector over time (Olokoyo, 2011). Commercial banks have a greater capacity for varying the aggregate volume of credit than other financial intermediaries. Commercial banks are institutions that engage in two distinct types of activities, one on each side of the balance sheet deposit-taking and lending (Kashyap *et al.*, 2002). A sound, profitable, competent and well managed banks enable both the economy and the country to stay competitive and able to withstand any negative shocks (Jamal *et al.*, 2012). In any given economy, banks act as a link through which clients deposit funds and get credit facilities. Commercial banks are the dominant players in the financial services. Consequently, commercial banks make money from the difference between the rate at which they accept customers' deposits and the rate which they charge the borrowers.

* Ms. KC is a Freelance Researcher, Kathmandu, Nepal.

Choi and Choi (2021) examined how monetary policy affects the funding composition of the banking sector. When monetary tightening reduces the supply of retail deposits, banks attempt to substitute wholesale funding for deposit outflows to smooth their lending. Because of financial frictions, banks have varying degrees of access to wholesale funding. Therefore, large banks, or those with greater reliance on wholesale funding, increase their wholesale funding more. Consequently, monetary tightening increases both the reliance on and the concentration of wholesale funding within the banking sector. The findings also suggested that liquidity requirements could bolster monetary policy transmission through the bank lending channel. Matousek and Solomon (2018) found that the Central Bank of Nigeria's (CBN) policy of consolidation and restructuring from 2002 to 2008 strengthened the bank lending channel (BLC). The study used the Generalized Method of Moments (GMM) two step estimator to test the existence of the BLC using a sample of 23 banks. The results showed that the loan growth is more sensitive to changes in bank size and capitalization. Furthermore, the central bank's restructuring activities improved the impact of the BLC. Abuka et al. (2019) showed that a monetary contraction reduces bank credit supply increasing loan application rejections and tightening loan volume and rates especially for banks with more leverage and sovereign debt exposure. There are associated spillovers on inflation and economic activity including construction permits and trade and even social unrest.

Monetary policy influences the economy's performance through control of bank credit, quantity of money, bank deposits, interest rate, and other aspects such as inflation, national production, and employment. Monetary policy is the tool used by monetary authorities to maintain the stability of price and control the supply of money in an economy. Oluwapelumi *et al.* (2021) investigated the impact of monetary policy on assets management of banks in Nigeria. The result from study revealed that monetary policy rate and cash reserve requirement have significant and positive effect on bank asset management while liquidity rate had an insignificant negative effect on bank asset management. Ekta *et al.* (2023) investigated the monetary transmission in India through bank lending channel, to know whether a change in monetary policy affects bank loans or not. The result of the study showed that the changes in cash reserve ratio directly impact loan growth. Ananou *et al.* (2021) analyzed the liquidity regulation and bank lending. The result of the study revealed that the effect of an increase in bank capital on credit growth has significantly negative at low liquidity ratios, becoming significantly positive only after large banks retain sufficient liquid assets.

Banks are exposed to adverse movements in interest rates because on average, rates on their long, fixed-term assets are locked in for longer than rates on their liabilities. When the general level of interest rates rises, banks typically experience a loss in economic value as the value of assets decreases more than the value of liabilities. Beutler et al. (2020) analyzed the transmission of realized interest rate risk to bank lending. The study exploits unique supervisory information about the interest rate risk exposure of Swiss banks net of hedging. By weakening the banks' economic capital, realized interest rate risk explains on average around one eighth or 30 basis points of the predicted total reduction in cumulative loan growth a year after an upward shock in nominal rates by one percentage point. Moreover, heterogeneity in exposures implies that the effects would differ across institutions. Finally, bank lending is mainly driven by the banks' capital- rather than their liquidity-situation. Borio and Gambacorta (2017) analyzed the effectiveness of monetary policy on bank lending in a low interest rate environment. Based on a sample of 108 large international banks, our empirical analysis suggests that monetary policy is less effective in stimulating bank lending growth when interest rates reach a very low level. This result holds after controlling for business and financial cycle conditions and different bank-specific characteristics such as liquidity, capitalization, funding costs, bank risk and income diversification. The study found that the impact of low rates on the profitability of banks' traditional intermediation activity helps explain the subdued evolution of lending in the period 2010–2014.

Ali *et al.* (2023) investigated the impact of interest rates on banks' deposits and financing. The study found that interest rates have significant and positive relationship with both deposits and financing of Malaysian Islamic Banks in the long run. Similarly, Ostadi and Sarlak (2014) concluded that interest rate and money supply positively and significantly impact bank deposits. Abdul Kader and Yap (2008) investigated the impact of interest rate changes on the demand for Islamic financing in a dual banking system where Islamic financing is dominated by Bai Bithamin Ajil (BBA) asset financing which replicate conventional bank loans. Using monthly data from 1999 to 2007, the study found that Islamic residential property financing exhibits a positive and fairly significant response to a shock in conventional residential property loans. This would imply a substitution effect. However, the response is not immediate and takes place only after one month. A possible explanation for this slow reaction is that, because BBA financing rate is fixed customers need time to reach a decision on whether or not to obtain financing from the Islamic bank based on their expectations of future interest rates movements. The study also found that unlike conventional bank residential property loans, Islamic residential property financing seems to respond more readily to a shock in the BLR. This again suggests that given the fixed rate of BBA financing, any change in the base lending rate would influence customers' decision in obtaining Islamic bank asset financing. Overall, the study concluded that the structural weakness of the fixed BBA mechanism exposes Islamic banks in a dual system to risks of interest rate movements.

Capital is seen as a strong support to protect depositors and promote the stability and efficiency of financial system around the world. Bank with a strong capital position is capable to better track business opportunities and have more time and elasticity to deal with the difficulties arising from unexpected losses and thereby achieve a higher return. Akbar (2023) analyzed the effect of capital adequacy ratio on loan to deposit ratio. The study found that the capital adequacy ratio, non- performing loan, operating costs to operating income, net interest margin had significant effect on loan to deposit ratio. The result of the study revealed that capital adequacy ratio has a positive and significant influence on loan to deposit ratio at state-owned banks in Indonesia. Zaid and Khan (2022) investigated the effects of non-performing loans on the profitability and lending behavior of commercial banks in Yemen. The results of the study indicated that there is a positive and significant effect of the non-performing loans ratio on the return on equity of commercial banks in Yemen. The study found no effect of non-performing loans on the return on assets and loans and advances growth of commercial banks in Yemen. Ughulu (2023) analyzed the problem of non-performing loans on deposit money banks profitability in Nigeria. The result showed that non-performing loan ratios has statistically significant but negative influence on deposit money banks profitability. Gjeci *et al.* (2023) investigated whether the level of non-performing loans affects the bank lending behavior. The result showed that there is a significant and negative impact of non-performing loans on bank lending.

In the context of Nepal, Bhattarai (2020) determined the commercial banks' lending in Nepal. The result showed that investment portfolio, cash reserve ratio and bank size have positive and significant effects on loan and advance. However, the liquidity has negative and statically significant with loan and advance. The macroeconomic variables gross domestic products growth rate and inflation rate have not effective roles plays to determine the loan and advance. The study concluded that liquidity, investment portfolio, cash reserve ratio and bank size were major determinants of loan and advance. Goet *et al.* (2021) investigated the bank specific and macroeconomic variables including total deposit, cash reserve ratio, interest spread rate and inflation rate on the loan and advances of joint venture banks operating in Nepal. This study found that there is the significant and positive correlation between loan and advances and total deposit. Loan and advances have significant and negative correlation with inflation rate. The study also found that the total deposit and inflation rate have significant impact on loan and advances but cash reserve ratio and interest spread rate do not give any significant influence

on loan and advances.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of interest rate, monetary policy, liquidity and non- interest income on loans and deposits of 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 impact of interest rate, monetary policy, liquidity and non- interest income on loans and deposits of Nepalese commercial banks. Specifically, it examines the relationship of interest rate, capital adequacy ratio, cash reserve ratio, liquidity, non-performing loan and non-interest income on loan to deposit and loan to asset 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 secondary data which were collected from 11 Nepalese commercial banks from 2013/14 to 2022/23, leading to a total of 110 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	2013/14 - 2022/23	10
2	Everest Bank Limited	2013/14 - 2022/23	10
3	NIC Asia Bank Limited	2013/14 - 2022/23	10
4	Machhapuchchhre Bank Limited	2013/14 - 2022/23	10
5	Himalayan Bank Limited	2013/14 - 2022/23	10
6	Nepal Bank Limited	2013/14 - 2022/23	10
7	Nepal SBI Bank limited	2013/14 - 2022/23	10
8	Prime Commercial Bank Limited	2013/14 - 2022/23	10
9	Standard Chartered Bank Nepal Limited	2013/14 - 2022/23	10
10	Siddhartha Bank Limited	2013/14 - 2022/23	10
11	Sanima Bank Limited	2013/14 - 2022/23	10

Thus, the study is based on 110 observations.

The model

The model used in this study assumes that loan ratio depends upon interest rate, monetary policy, liquidity and non- interest income. The dependent variables selected for the study are loan

to deposit ratio and loan to asset ratio. Similarly, the selected independent variables are interest rate, capital adequacy ratio, cash reserve ratio, liquidity, non- performing loan and non-interest income. Therefore, the models take the following forms:

$$\text{LDR} = \beta_0 + \beta_1 \text{INT}_{it} + \beta_2 \text{CAR}_{it} + \beta_3 \text{CRR}_{it} + \beta_4 \text{NPL}_{it} + \beta_5 \text{LIQ}_{it} + \beta_6 \text{NII}_{it} + e_{it}$$

$$\text{LAR} = \beta_0 + \beta_1 \text{INT}_{it} + \beta_2 \text{CAR}_{it} + \beta_3 \text{CRR}_{it} + \beta_4 \text{NPL}_{it} + \beta_5 \text{LIQ}_{it} + \beta_6 \text{NII}_{it} + e_{it}$$

Where,

LDR = Loan to deposit ratio as measured by the ratio of loan and advances for customers to total deposits, in percentage.

LAR = Loan to assets ratio as measured by the ratio of loan and advances for customers to total assets, in percentage.

INR= Interest rate as measured as weighted average interest rate spread, in percentage.

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

CRR= Cash reserve ratio, in percentage.

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

LIQ = Liquidity as measured by cash and cash equivalent, Rs in billion.

NII= Non interest income, Rs in billion.

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

Interest rate

Mushtaq and Siddiqui (2016) revealed that interest rate has a positive significant relationship with saving in case of non-Islamic countries. Eriemo (2014) concluded that interest rate has a positive significant impact on bank deposits in Nigeria. In addition, Ojeaga *et al.* (2013) concluded that interest rate and income have a strong positive impact on bank deposits in Nigerian Banking sector. Similarly, Ostadi and Sarlak (2014) concluded that the interest rate and money supply positively and significantly impact bank deposits. Likewise, Mashamba *et al.* (2014) concluded that there is a positive relationship between deposit interest rate and bank deposits in Zimbabwe. Afzal *et al.* (2023) concluded that there is a positive and significant influence of interest rates on the deposits. Based on it, this study develops the following hypothesis:

H₁: There is a positive relationship between interest rate and bank loan and deposit.

Liquidity

The liquidity ratio is the proportion of total deposits to be kept in specified liquid assets mainly to safeguard the ability of the banks to meet depositors' cash withdrawals and ensure confidence in the banking system (Olweny and Chiluwe, 2012). Tamunosiki *et al.* (2017) showed a significant positive relationship between loan-to deposit ratio and liquidity ratio. Likewise, Olawaju and Adeyemi (2015) concluded that there is a positive relationship between liquidity ratio and deposit money bank's

profitability. Malede (2014) revealed that there is significant relationship between commercial bank lending and its size, credit risk, gross domestic product and liquidity ratio. Based on it, this study develops the following hypothesis:

H₂: There is a positive relationship between liquidity and bank loan and deposit.

Non- interest income

Non-interest income refers to revenue generated by banks from sources other than interest-bearing assets, such as fees from services like investment banking, wealth management, and advisory services. When banks have higher non-interest income, it can indicate diverse revenue streams and potentially greater financial stability (Edem, 2017). Ejoh et al. (2014) revealed that there is a positive relationship between non- interest income and loan to deposit ratio. This increased financial stability and revenue diversification can lead to a greater willingness and capacity for banks to extend loans. Additionally, higher non-interest income can provide banks with more resources to lend out, potentially increasing the availability of loans to borrowers (Kashyap et al., 2002). Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between non- interest income and bank loan and deposit.

Cash reserve ratio

Cash reserve ratio is one of the most powerful instruments of monetary control. It is used to increase or reduce the liquidity of banks. When the cash reserve requirement is lowered, banks have more funds available to lend out, as they are required to keep fewer reserves. This can lead to an increase in the availability of loans and advances, which can stimulate economic activity and growth. Birhanu *et al.* (2021) showed that cash reserve requirement has a significant and positive impact on loan and advances. Likewise, Benjamin and Onyewuchi (2015) revealed that cash reserve ratio has a significant relationship on bank loan. Similarly, Goet (2021) revealed that cash reserve ratio has a significant impact on bank lending. Olusanya et al. (2012) found that cash reserve ratio has a significant impact on loan to deposit. Based on it, this study develops the following hypothesis:

H₄: There is a positive and significant relationship between cash reserve ratio and bank loan and deposit.

Capital adequacy ratio

Capital adequacy ratio is how a bank is able to finance its activities with its capital ownership. Bateni *et al.* (2014) revealed that there is a positive relationship between capital adequacy ratio and loan to deposit ratio. A higher capital adequacy ratio indicates that a bank has more capital relative to its risk-weighted assets. Banks with higher capital buffers are better positioned to absorb losses from defaulted loans without jeopardizing their solvency. This increased financial strength allows banks to lend more confidently, potentially leading to a higher loan-to-deposit ratio. Similarly, Dreca (2014) revealed that there is a positive relationship between capital requirements and loan growth. Hafez (2018) showed that there is a positive relationship between capital adequacy ratio and loan to deposit. Banks with a higher capital adequacy ratio may have a greater appetite for risk-taking, as they have more capital to cushion potential losses. Consequently, they may be more willing to extend loans, resulting in a higher loan-to-deposit ratio. Similarly, Aktas et al. (2015) revealed that capital adequacy ratio has a positive and significant effect on loan to deposit ratio. Based on it, this study develops the following hypothesis:

H₅: There is a positive relationship between capital adequacy ratio and bank loan and deposit.

Non-performing loans

Banks are required to maintain a certain level of capital adequacy to cover potential losses from these non-performing assets. When NPLs are high, banks may have less capital available to issue new loans. Messai and Jouini (2013) revealed that there is a negative relationship between non-performing loan and loan to deposit ratio. Banks may tighten their lending criteria and conduct more stringent assessments of borrower creditworthiness when NPLs are elevated. This can result in fewer loans being approved and disbursed. Likewise, Khairi et al. (2021) revealed that there is a negative relationship between non-performing loan and loan to deposit. Saba et al. (2012) found that the non-performing loan has a negatively impact on the loan to deposit ratio. Based on it, this study develops the following hypothesis:

H₆: There is a negative relationship between non-performing loan and bank loan and deposit.

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 11 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are LDR (Loan to deposit ratio as measured by the ratio of loan and advances for customers to total deposits, in percentage) and LAR (Loan to assets ratio as measured by the ratio of loan and advances for customers to total assets, in percentage). the independent variables are INR (Interest rate as measured as weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to risk weighted exposures, in percentage), CRR (Cash reserve ratio, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), LIQ (Liquidity as measured by cash and cash equivalent, Rs in billion) and NII (Non-interest income, Rs in billion).

Variables	Minimum	Maximum	Mean	Std. Deviation
LDR	0.18	7.98	1.10	1.22
LAR	0.13	0.80	0.65	0.10
CAR	4.55	22.99	13.81	2.64
NPL	0.01	5.82	1.30	1.39
CRR	2.89	37.52	17.62	9.61
LIQ	0.15	86.67	8.34	10.68
NII	0.04	8.34	0.77	0.92
INR	2.94	7.16	4.30	0.73

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 variables of 11 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are LDR (Loan to deposit ratio as measured by the ratio of loan and advances for customers to total deposits, in percentage) and LAR (Loan to assets ratio as measured by the ratio of loan and advances for customers to total assets, in percentage). The independent variables are INR (Interest rate as measured as weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to risk weighted exposures, in percentage), CRR (Cash reserve ratio, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), LIQ (Liquidity as measured by cash and cash equivalent, Rs in billion) and NII (Non-interest income, Rs in billion).

Variables	LDR	LAR	CAR	NPL	LIQ	CRR	NII	INR
LDR	1							
LAR	0.261**	1						
CAR	-0.005	-0.168	1					
NPL	-0.182	-0.330**	-0.031	1				
LIQ	-0.088	-0.079	0.126	-0.086	1			
CRR	0.199*	0.056	0.068	0.072	-0.078	1		
NII	-0.124	0.131	0.035	-0.039	0.221*	-0.036	1	
INR	-0.147	-0.395**	0.151	0.447**	-0.101	0.231*	-0.107	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 negative relationship with loan to deposit ratio. It means that increase in capital adequacy ratio leads to decrease in loan to deposit ratio. Similarly, there is a negative relationship between non-performing loan and loan to deposit ratio. It means that increase in non-performing loan leads to decrease in loan to deposit ratio. In addition, liquidity has a negative relationship with loan to deposit ratio. It indicates that increase in liquidity leads to decrease in loan to deposit ratio. In contrast, there is a positive relationship between cash reserve ratio and loan to deposit ratio. It indicates that increase in cash reserve ratio leads to increase in loan to deposit ratio. Likewise, non-interest income has a negative relationship with loan to deposit ratio. It indicates that higher the non-interest income, lower would be the loan to deposit ratio. In addition, interest rate has a negative relationship with loan to deposit ratio. It indicates that increase in interest rate leads to decrease in loan to deposit ratio.

Similarly, the result also shows that capital adequacy ratio has a negative relationship with loan to asset ratio. It means that increase in capital adequacy ratio leads to decrease in loan to asset ratio. Similarly, there is a negative relationship between non-performing loan and loan to asset ratio. It means that increase in non-performing loan leads to decrease in loan to asset ratio. In addition, liquidity has a negative relationship with loan to asset ratio. It indicates that increase in liquidity leads to decrease in loan to asset ratio. In contrast, there is a positive relationship between cash reserve ratio and loan to asset ratio. It indicates that increase in cash reserve ratio leads to increase in loan to asset ratio. Likewise, non-interest income has a positive relationship with loan to asset ratio. It indicates that higher the non-interest income, higher would be the loan to asset ratio. Moreover, interest rate has a negative relationship with loan to asset ratio. It indicates that increase in interest rate leads to decrease in loan to asset ratio.

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, liquidity, cash reserve ratio, non-interest income and

interest rate with loan to deposit of Nepalese commercial banks.

Table 4

Estimated regression results of capital adequacy ratio, non- performing loan, liquidity, cash reserve ratio, non-interest income and interest rate with loan to deposit ratio

The results are based on panel data of 11 commercial banks with 110 observations for the period of 2013/14-2022/23 by using the linear regression model and the model is $LDR = \beta_0 + \beta_1 INT_{it} + \beta_2 CAR_{it} + \beta_3 CRR_{it} + \beta_4 NPL_{it} + \beta_5 LIQ_{it} + \beta_6 NII_{it} + e_{it}$ where, the dependent variable is LDR (Loan to deposit ratio as measured by the ratio of loan and advances for customers to total deposits, in percentage). the independent variables are INR (Interest rate as measured as weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to risk weighted exposures, in percentage), CRR (Cash reserve ratio, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), LIQ (Liquidity as measured by cash and cash equivalent, Rs in billion) and NII (Non-interest income, Rs in billion).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	NPL	LIQ	CRR	NII	INR			
1	1.146 (1.823)	-0.004 (0.081)						0.009	1.229	0.006
2	1.308 (8.179)		-0.162 (1.916)					0.024	1.214	3.670
3	1.485 (0.622)			-0.04 (0.163)				0.009	1.229	0.027
4	0.654 (2.677)				0.025 (2.053)			0.009	1.229	0.027
5	5.382 (2.358)					-0.493 (1.88)		0.023	1.210	3.535
6	2.153 (3.105)						-0.245 (1.546)	0.013	1.216	2.389
7	1.389 (2.169)	-0.006 (0.13)	-0.162 (1.91)					0.015	1.220	1.827
8	1.389 (2.169)	-0.005 (0.111)	-0.162 (1.897)	-0.021 (0.086)				0.006	1.226	1.209
9	0.274 (0.114)	-0.017 (0.385)	-0.178 (2.121)	-0.082 (0.328)	0.002 (2.242)			0.043	1.203	2.198
10	0.274 (0.114)	-0.008 (0.181)	-0.184 (2.251)	-0.606 (1.92)	0.031 (2.539)	-0.890 (2.659)		0.096	1.169	3.278
11	0.274 (0.114)	-0.008 (0.181)	-0.113 (1.237)	-0.606 (1.92)	0.035 (2.826)	-0.967 (2.883)	-0.296 (1.643)	0.111	1.159	3.225

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.
- Loan to deposit ratio is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are negative with loan to deposit ratio. It indicates that capital adequacy ratio has a negative impact on loan to deposit ratio. This finding is similar to the findings of Bateni *et al.* (2014). Similarly, the beta coefficients for non-performing loan are negative with loan to deposit ratio. It indicates that non-performing loan has a negative impact on loan to deposit ratio. This finding is similar to the findings of Messai and Jouini (2013). Likewise, the beta coefficients for liquidity are negative with loan to deposit ratio. It indicates that liquidity has a negative impact on loan to deposit ratio. This finding contradicts with the findings of Tamunosiki *et al.* (2017). In addition, the beta coefficients for cash reserve ratio are positive with loan to deposit ratio. It indicates that cash reserve ratio has a positive impact on loan to deposit ratio. This finding is consistent with the findings of Birhanu *et al.* (2021). Further, the beta coefficients for non-interest income are negative with loan to deposit ratio. It indicates that non-interest income has a negative impact on loan to deposit ratio. This finding is similar to the findings of Ejoh *et al.* (2014). Moreover, the beta coefficients for interest rate are negative with loan to deposit ratio. It indicates that interest rate has a negative impact on loan to deposit ratio. This finding is similar to the findings of

Ostadi and Sarlak (2014).

Table 5 shows the regression results of capital adequacy ratio, non- performing loan, liquidity, cash reserve ratio, non-interest income and interest rate with loan to asset ratio of Nepalese commercial banks.

Table 5

Estimated regression results of capital adequacy ratio, non- performing loan, liquidity, cash reserve ratio, non-interest income and interest rate with loan to assets ratio

The results are based on panel data of 11 commercial banks with 110 observations for the period of 2013/14-2022/23 by using the linear regression model and the model is $LAR = \beta_0 + \beta_1 INT_{it} + \beta_2 CAR_{it} + \beta_3 CRR_{it} + \beta_4 NPL_{it} + \beta_5 LIQ_{it} + \beta_6 NII_{it} + e_{it}$ where, the dependent variable is LAR (Loan to assets ratio as measured by the ratio of loan and advances for customers to total assets, in percentage). the independent variables are INR (Interest rate as measured as weighted average interest rate spread, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to risk weighted exposures, in percentage), CRR (Cash reserve ratio, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loans to total loans, in percentage), LIQ (Liquidity as measured by cash and cash equivalent, Rs in billion) and NII (Non-interest income, Rs in billion).

Model	Intercept	Regression coefficients of						Adj. R_bar ²	SEE	F-value
		CAR	NPL	LIQ	CRR	NII	INR			
1	0.755 (14.521)	-0.008 (2.034)						0.028	0.101	4.137
2	0.684 (52.786)		-0.025 (3.616)					0.101	0.098	13.073
3	0.592 (2.946)			0.006 (0.293)				0.008	0.103	0.086
4	0.641 (30.93)2				0.001 (0.555)			0.006	0.103	0.308
5	0.343 (1.778)					0.036 (1.605)		0.014	0.102	2.574
6	0.89 (16.38)						-0.055 (4.455)	0.147	0.095	19.851
7	0.89 (16.38)	-0.008 (2.263)	-0.025 (3.773)					0.134	0.096	9.348
8	0.637 (3.391)	-0.009 (2.383)	-0.025 (3.799)	0.017 (0.871)				0.132	0.096	6.470
9	0.579 (2.993)	-0.009 (2.522)	-0.026 (3.891)	0.022 (1.089)	0.001 (1.207)			0.136	0.095	5.233
10	0.446 (2.167)	-0.009 (2.506)	-0.026 (3.866)	-0.007 (0.272)	0.001 (1.008)	0.048 (1.763)		0.153	0.096	4.893
11	0.69 (3.167)	-0.007 (2.037)	-0.016 (2.231)	-0.01 (0.42)	0.002 (1.567)	0.038 (1.435)	-0.045 (2.788)	0.205	0.092	5.641

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.
- Loan to assets ratio is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are negative with loan to asset ratio. It indicates that capital adequacy ratio has a negative impact on loan to asset ratio. This finding is similar to the findings of Dreca (2014). Similarly, the beta coefficients for non-performing loan are negative with loan to asset ratio. It indicates that non- performing loan has a negative impact on loan to asset ratio. This finding is similar to the findings of Khairi et al. (2021). Likewise, the beta coefficients for liquidity are negative with loan to asset ratio. It indicates that liquidity has a negative impact on loan to asset ratio. This finding contradicts with the findings of Malede (2014). In addition, the beta coefficients for cash reserve ratio are positive with loan to asset ratio. It indicates that cash reserve ratio has a positive impact on loan to asset ratio. This finding is consistent with the findings of Benjamin and Onyewuchi (2015). Further, the beta coefficients for non-interest income are positive

with loan to asset ratio. It indicates that non- interest income has a positive impact on loan to asset ratio. This finding is similar to the findings of Kashyap et al. (2002). Moreover, the beta coefficients for interest rate are negative with loan to asset ratio. It indicates that interest rate has a negative impact on loan to asset ratio. This finding is similar to the findings of Afzal et al. (2023).

4. Summary and conclusion

Commercial banks run a significant risk of loan default and difficulties paying depositors during these operations. These risks can be linked to a number of reasons, including unstable economic conditions, political unpredictability, and other bank-related issues that may or may not be prevented. These dangers could impair the banking system's stability in the long run as well as its financial performance. Banking institutions are business entities dedicated to financial intermediation, involving the allocation of surplus liquidity among different economic agents. They use deposits and other liabilities from people or firms with a surplus of resources, redirecting them to economic agents who lack such resources, in the form of loans and other assets.

This study attempts to analyse the impact of interest rate, monetary policy, liquidity and non-interest income on loans and deposits of Nepalese commercial banks. The study is based on secondary data of 11 commercial banks with 110 observations for the period from 2013/14 to 2022/23.

The major conclusion of this study is that cash reserve ratio has a positive impact on loan to deposit and loan to asset. It indicates that increase in cash reserve ratio increase in loan to deposit and loan to asset. Similarly, capital adequacy ratio, non- performing loan and interest rate have negative impact on loan to deposit and loan to asset. It indicates that increase in capital adequacy ratio, non-performing loan, interest rate leads to decrease in loan to deposit ratio and loan to asset ratio. Moreover, liquidity and non-interest income has a negative impact on loan to deposit ratio but positive impact on loan to asset ratio. Likewise, the study also concluded that non- interest income followed by non-performing loan is the most influencing factor that explains the changes in the loan to asset ratio of Nepalese commercial banks. Similarly, the study also concluded that non- interest income followed by interest rate is the most influencing factor that explains the changes in loan on deposit ratio in the context of Nepalese commercial banks.

References

- Abdul Kader, R., and K. L. Yap, 2008. The impact of interest rate changes on Islamic bank financing. *International Business Research* 8(1), 24-26.
- Abuka, C., R. K. Alinda, C. Minoiu, J. L. Peydró, and A. F. Presbitero, 2019. Monetary policy and bank lending in developing countries: Loan applications, rates, and real effects. *Journal of Development Economics* 139(1), 185-202.
- Afzal, A., N. Mirza, and S. Firdousi, 2023. Do depositors discipline the banking sector? Evidence from an emerging economy. *Review of Accounting and Finance* 22(2), 194-205.
- Akbar, M., 2023. Analysis of the effect of capital adequacy ratio, non-performing loan, and operating cost operating income, net interest margin to loan to deposit ratio of state-owned banks in Indonesia. *Journal of Social Research* 2(5), 1591-1607.
- Aktas, R., S. Acikalin, B. Bakin, and G. Celik, 2015. The determinants of banks' capital adequacy ratio: Some evidence from South Eastern European countries. *Journal of Economics and Behavioral Studies*, 7(1), 79-88.

- Ali, M. H., N. A. Rahim, and M. H. D. H. Yahya, 2023. How do interest rate changes affect Islamic banks? Empirical evidence on Islamic banks in Malaysia. *IPN Journal of Research and Practice in Public Sector Accounting and Management* 10(1), 97-115.
- Ananou, F., D. Chronopoulos, A. Tarazi, and J. O. Wilson, 2021. Liquidity regulation and bank lending. *Journal of Corporate Finance* 69(1), 101-119.
- Bateni, L., H. Vakilifard, and F. Asghari, 2014. The influential factors on capital adequacy ratio in Iranian banks. *International Journal of Economics and Finance* 6(11), 108-116.
- Benjamin, U. D., and G. O. Onyewuchi, 2015. Determinants of deposit money banks loans and advances in Nigeria. *Global Journal of Applied, Management and Social Sciences* 10(1), 60-68.
- Beutler, T., R. Bichsel, A. Bruhin, and J. Danton, 2020. The impact of interest rate risk on bank lending. *Journal of Banking and Finance* 115(1), 105-119.
- Birhanu, T., S. Boshu Deressa, H. Azadi, A. H. Viira, S. Van Passel, and F. Witlox, 2021. Determinants of commercial bank loan and advance disbursement: the case of private Ethiopian commercial banks. *International Journal of Bank Marketing* 39(7), 1227-1247.
- Borio, C., and L. Gambacorta, 2017. Monetary policy and bank lending in a low interest rate environment: diminishing effectiveness? *Journal of Macroeconomics* 54(1), 217-231.
- Choi, D. B., and H. S. Choi, 2021. The effect of monetary policy on bank wholesale funding. *Management Science* 67(1), 388-416.
- Dreca, N., 2014. Determinants of capital adequacy ratio in selected Bosnian banks. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi* 12(1), 149-162.
- 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.
- Ejoh, N., I. Okpa, and E. Inyang, 2014. The relationship and effect of credit and liquidity risk on bank default risk among deposit money banks in Nigeria. *Research Journal of Finance and Accounting* 5(16), 142-150.
- Ekta, K., C. Kshamta, and S. B. Prasad, 2023. Policy interest rate and bank profitability-scheduled commercial banks in India. *Finance: Theory and Practice* 27(1), 138-149.
- Eriemo, N. O., 2014. Macroeconomic determinants of bank deposits in Nigeria. *Journal of Economic and Sustainable Development* 5(10), 49-58.
- Gjeci, A., M. Marinc, and M. Rant, 2023. Non-performing loans and bank lending behavior. *Risk Management* 25(1), 7-16.
- Goet, J., 2021. Effect of determinants of lending behavior on loan and advances in joint venture commercial banks in Nepal. *The Journal of Economic Concerns* 12(1), 91-97.
- Hafez, M. M. H., 2018. Examining the relationship between efficiency and capital adequacy ratio: Islamic versus conventional banks-empirical evidence on Egyptian banks. *Accounting and Finance Research*, 7(2), 232-247.
- Jamal, A.A.A., M. Hamidi, and M. R. A Karim, 2012. Determinants of commercial banks' return on asset: panel evidence from Malaysia. *International Journal of Commerce, Business and Management* 1(3), 55-62.
- Kashyap, A. K., R. Rajan, and J. C. Stein, 2002. Banks as liquidity providers: An explanation for the coexistence of lending and deposit-taking. *The Journal of Finance* 57(1), 33-73.
- Khairi, A., B. Bahri, and B. Artha, 2021. A literature review of non-performing loan. *Journal of Business and Management Review* 2(5), 366-373.

- Malede, M., 2014. Determinants of commercial banks' lending: evidence from Ethiopian commercial banks. *European Journal of Business and Management* 6(20), 109-117.
- Mashamba, T., R. Magweva, and L. C. Gumbo, 2014. Analyzing the relationship between banks' deposit interest rate and deposit mobilization: Empirical evidence from Zimbabwean Commercial Banks (1980-2006). *Journal of Business and Management* 16(1), 64-75.
- Matousek, R., and H. Solomon, 2018. Bank lending channel and monetary policy in Nigeria. *Research in International Business and Finance* 45(1), 467-474.
- 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.
- Mushtaq, S., and D. A. Siddiqui, 2016. Effect of interest rate on economic performance: Evidence from Islamic and non-Islamic economies. *Financial Innovation* 2(1), 1-14.
- Ojeaga, P., D. Ojeaga, and D. O. Odejimi, 2013. The impact of interest rate on bank deposits evidence from the Nigerian banking sector. *MPRA Paper No. 53238*.
- Olarewaju, O. M., and O. K. Adeyemi, 2015. Causal relationship between liquidity and profitability of Nigerian deposit money banks. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 5(2), 165-171.
- Olokoyo, F. O., 2011. Determinants of commercial banks' lending behavior in Nigeria. *International Journal of Financial Research* 2(2), 61-73.
- Olusanya, S. O., A. O. Oyebo, and E. C. Ohadebere, 2012. Determinants of lending behaviour of commercial banks: Evidence from Nigeria, a co-integration analysis (1975-2010). *Journal of Humanities and Social Science* 5(5), 71-80.
- Oluwapelumi, O.S., A. Samuel, and O. Aina, 2021. The impact of monetary policy on assets management of deposit money banks in Nigeria. *Journal of Finance and Accounting* 9(3), 60-66.
- Olweny, T., and M. Chiluwe, 2012. The effect of monetary policy on private sector investment in Kenya. *Journal of Applied Finance and Banking* 2(2), 239-287.
- Ostadi, H., and A. Sarlak, 2014. Effective factors on the absorption of bank deposits in order to increase the relative share of Isfahan Sepah Bank. *International Journal of Academic Research in Economics and Management Sciences* 3(4), 139-149.
- Saba, I., R. Kouser, and M. Azeem, 2012. Determinants of non-performing loans: Case of US banking sector. *The Romanian Economic Journal* 44(6), 125-136.
- Tamunosiki, K., I. B. Giami, and O. B. Obari, 2017. Liquidity and performance of Nigerian banks. *Journal of Accounting and Financial Management* 3(1), 34-46.
- Ughulu, S. E., and S. I. Odion, 2023. Non-performing loans and deposit money bank's profitability. *African Journal of Management and Business Research* 12(1), 98-123.
- Zaid, M., and M. F. Khan, 2022. Non-performing loans effects on profitability and lending behavior of commercial banks: Empirical evidence. *Studies in Economics and Business Relations* 3(2), 28-35.