

# MANAGEMENT IN NEW MILLENNIUM

A Perspective from an Emerging Economy of Nepal

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B U D D H A



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# MEET THE EDITORS

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# PREFACE

When the first editor of this book went to Florida State University as a Fulbright Visiting Faculty, Prof. James S. Ang asked whether theory and practice of management in emerging markets like Nepal are different from those of developed countries, mainly USA; and whether Management text books written in the context of developed countries like USA are relevant in the context of emerging markets like Nepal. Hence, one of the main reasons to write this book is to indicate the main differences on theory and practice of management in emerging markets other than the developed ones. Based on our many years of teaching, learning, and research, we are of the view that theory and practice of management differ greatly in emerging markets as compared to the developed ones. We are of the view that management problems faced by emerging markets differ from that of the developed ones. The emerging markets have their own features which are all so unique. The economic, social, demographic, technological and political trends are so different that they are unique to emerging markets, especially Nepal. Due to this, theory and practice of management have also gone different. As a result, the legal provisions and institutional arrangements for achieving efficient management have also have gone different. They have also changed over a period of time. This book therefore aims at providing academicians and practitioners with a knowledge of the differences in management theories and practices in an emerging market setting.

The book has been divided into 6 parts. Part I is devoted to the studies on capital markets in Nepal while Part II is devoted to studies relating to capital structure in Nepal. Similarly, Part III is concerned with studies on corporate finance in Nepal while Part IV contains studies on Nepalese financial institutions. Likewise, Part V is devoted to studies relating to Nepalese marketing while Part VI is concerned with studies on Nepalese human resource management.

In Part I, Subedi and Pradhan examine the determinants of market stock price movement of Nepalese commercial banks. It shows how earnings per share, price earnings ratio, dividend per share, inflation, lending rate and return on assets affect market price per share and change in market price per share. Raman analyzes the effect of macro-economic variables on stock return of Nepalese commercial banks. It offers insights into how gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate affect market price per share and stock return. Rayamaji analyzes the impact of political instability, macroeconomic and bank-specific factors on the profitability of Nepalese commercial banks. It indicates how political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size affect return on asset and return on equity.

In Part II, Thakur investigates the effect of liquidity, leverage and profitability on firm value of Nepalese insurance companies. It shows how current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity affect market capitalization and book value per share. Pandit examines the interrelationship between capital structure and corporate pay-out policy of Nepalese commercial banks. It offers insights into how debt to equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size affect dividend pay-out ratio and dividend per share.

In Part III, Sah analyzes the impact of liquidity and bank size on the profitability of Nepalese commercial banks. It shows how current ratio, cash reserve ratio, loan to assets ratio, total assets, total number of branches and total deposits affect Return on assets and net interest margin.

Pathak assesses the impact of corporate income tax on the performance of Nepalese commercial banks. It indicates how corporate income tax, total investment, liquidity position, firm size, firm growth and firm age affect return on asset and market price per share. Mahaseth investigates the effect of bank-specific, industry-specific and macroeconomic variables on the profitability of Nepalese commercial banks. It offers insights into how capital adequacy ratio, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation affect return on assets and return on equity.

In Part IV, Poudel examines the impact of credit portfolio management on the profitability of Nepalese commercial banks. It indicates how agriculture loan, real estate loan, term loan, corporate sector loan, government securities and term loan affect return on assets and net profit margin. Pratik analyzes the impact of macro-economic factors on the lending behaviour of Nepalese commercial bank. It shows how gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate affect total loan to total asset and total loan to total deposit. Shrestha investigates the impact of earnings management on the performance of Nepalese commercial banks. It offers insights into how capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities affect return on assets and return on equity. Karn examines the effects of macroeconomic indicators on the stability of the Nepalese financial system. It indicates how inflation, money supply, unemployment rate, GDP growth rate, exchange rate and interest rate affect return on equity and Z-score. Sah and Pradhan analyze the impact of macro-economic factors on the non-performing loans of Nepalese commercial banks. It shows how gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate affect non-performing loans and loan loss provision. Aryal investigates the impact of interest rate spread on the profitability of Nepalese commercial banks. It offers insights into how spread rate, credit risk, bank size, net interest margin, GDP and inflation affect return on assets and return on equity. Lama and Pradhan examine the effect of capital ratios on the risk, efficiency and profitability of Nepalese commercial banks. It indicates how Tier 1 capital ratio, total assets, capital adequacy ratio, Tier 1 to total assets, net loan to total assets and assets growth affect turn on assets, management efficiency and loan loss provision. Pangeni and Bista analyze the impact of macro-economic factors on the level of deposits of Nepalese commercial banks. It shows how GDP growth rate, inflation rate, broad money, exchange rate, interest rate and remittance affect total deposits and deposit growth rate. Joshi investigates the effect of market risk on the profitability of Nepalese commercial banks. It offers insights into how leverage, net interest margin, inflation, exchange rate, interest rate and bank size affect return on asset and return on equity.

Similarly, Upreti examines the impact of macro-economic and bank specific factors on the credit growth of Nepalese commercial banks. It indicates how gross domestic product, inflation rate, money supply, capital adequacy ratio, non-performing loan and bank size affect total loan and advances and loan growth. Pandit analyzes the impact of volume of deposits, facilities and profitability on liquidity in the context of Nepalese commercial banks. It shows how fixed deposit, saving deposit, current deposit, mobile banking, automated teller machine, point of sale, return on equity, and return on assets affect current ratio and cash reserve ratio. Kunwar examines the effect of banking performance on economic growth of Nepal. It shows how earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return affect gross domestic product and per capita income. Prajapati analyzes the effect of credit risk, liquidity and capital adequacy ratio on the profitability of Nepalese commercial banks. It offers insights into how capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio affect return on assets and net interest margin. Das and Pradhan analyze the determinants of the stability and profitability of Nepalese commercial banks. It indicates how bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic

product growth and inflation affect Z-score and return on assets. KC investigates the effect of credit management on the performance of Nepalese commercial banks. It shows how credit risk, client appraisal, collection policy, credit terms, capital adequacy ratio and non-performing loan affect return on assets and return on equity.

In Part V, Poudel and Dahal examine the impact of digital marketing on consumer behavior in Kathmandu Valley. It shows how digital advertising, social media marketing, mobile marketing, email marketing and product/service reviews affect consumer behavior. Mainali analyzes the effect of store atmosphere on consumer purchase intention in retail stores of Kathmandu Valley. It offers insights into how window display, product display, lighting, music, cleanliness and parking affect consumer purchase intention. Thapa assess the impact of e-banking on customer convenience in the context of Nepalese commercial banks. It indicates how security, ease of use, responsiveness, self-efficacy, reliability and feature availability affect consumer convenience. Kunwar investigates the impact of social media marketing on consumer buying behaviour of apparels in Kathmandu Valley. It shows how electronic word of mouth, blogs, social networking sites, micro blogging, social news site and media sharing system affect consumer buying behavior. Timalisina examines the impact of brand image and corporate branding on consumer choice of smart phones in Kathmandu. It offers insights how brand image, brand preference, brand loyalty, brand value and brand trust affect consumer choice. Shah investigates the impact of e-commerce on consumer satisfaction, behavior and loyalty in the context of Nepal. It indicates how advertisements, consumer interest, delivery time, website quality, trustworthiness, and corporate image affect consumer behavior, consumer satisfaction, and consumer loyalty. Kushwaha examines the factors influencing consumer buying behavior of vegetables products in Kathmandu Valley. It indicates how price, health, knowledge, environment concern and availability affect consumer buying behavior.

In Part VI, Sah analyzes the relationship between internet banking and customer retention in Nepalese commercial banks. It shows how assurance, ease of use, responsiveness, reliability, security and privacy affect customer retention. Limbu examines the factors influencing job satisfaction and its impact on job loyalty in the context of Nepalese commercial banks. It offers insights into how reward and recognition, training and development, workplace environment, team work, employee participation and employee empowerment affect job loyalty and job satisfaction. Khanal investigates the impact of working environment on employee job satisfaction in Nepalese commercial banks. It indicates how physical environment, psychological environment, supervisor support, safety at work and job stress affect job satisfaction. Upreti analyzes the impact of work ethics on organizational productivity in the context of Nepalese commercial banks. It shows how corruption, self-discipline, communication, morality, integrity and co-ordination affect Organizational productivity. Bhandari investigates the relationship between reward, employee motivation and turnover intention in the context of Nepalese commercial banks. It indicates how reward, salary, bonus and commission, promotion, training and development, recognition and autonomy support affect employee motivation and turnover intention.

Moreover, Shakya analyzes the impact of effective succession planning practices on employee retention in the context of Nepalese commercial banks. It offers insights into how talent management, career development programs, reward system, supervisor support and work environment affect employee retention. Rai examines the impact of leadership styles on financial performance of Nepalese commercial banks. It indicates how transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership affect return on assets and return on equity. Pandey analyzes the impact of human resource management practices on employee satisfaction and loyalty in the context of Nepalese commercial banks. It shows how compensation, training and development, recruitment and selection, performance appraisal

al, career planning and job design affect employee satisfaction and employee loyalty. Shrestha investigates the effect of gamified human resource management system on job satisfaction and engagement in Nepalese commercial banks. It offers insights into how enjoying in gaming, recognition through gaming, motivation, learning and development and usefulness of gaming affect job satisfaction and employee engagement.

This book would not be possible without the generous cooperation of the aricle 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 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. Bhuwan Poudel, Managing Director, Print Communications Private Limited for the speedy publication of this book. Needless to say, we alone are responsible for any deficiencies that may have remained in this book.

*September 2022*

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PART 1

# Capital Market



## Abstract

*This study attempts to examine the determinants of market stock price movement of Nepalese commercial banks. Market price per share and change in market price per share are selected as the dependent variables. Similarly, earnings per share, price earnings ratio, dividend per share, inflation, lending rate and return on assets are selected as the independent variables. This study is based on secondary data of 21 commercial banks with 168 observations for the study period from 2013/14 to 2020/21. The data are collected from Bank Supervision Report 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 different variables on the market stock price movement in the context of Nepalese commercial banks.*

*The study showed that earnings per share has a positive impact on market price per share and change in market price per share. It indicates that increase in earnings per share leads to increase in 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. It indicates that increase in price earnings ratio leads to increase in market price per share and change in market price per share. Likewise, inflation has a positive impact on market price per share and change in market price per share. It indicates that higher the inflation, higher would be the market price per share and change in market price per share. Moreover, lending rate has a negative impact 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, return on assets has a positive impact on market price per share and change in market price per share. It indicates that higher the return on assets, higher would be the market price per share and change in market price per share.*

**Key words:** Market price per share, earnings per share, dividend per share, price earnings ratio, inflation, lending rate and return on assets.

# 1. Introduction

Stock market has become an essential market playing a vital role in economic prosperity that fostering capital formation and sustainable economic growth. Stock markets operate as a facilitator between savers and users of capital by means of pooling of funds, sharing risk, and transferring wealth. Stock markets are essential for economic growth as they ensure the flow of resources to the most productive investment opportunities (Kurihara, 2006). Share price is a major determinant for the investment decision of investors in the share market because investors mainly focus on

price of shares when they decide to invest in shares. However, share prices are fluctuating every day, which is dependent on various internal factors like dividend pay-out, dividend yield, dividend per share, sales growth, leverage, earnings volatility and firm size as well as external factors like exchange rate, inflation and GDP. Therefore, investors need to have knowledge and awareness about the factors which determine share price in order to make an optimum investment decision (Sharif et al., 2015). Due to operating risk, there is a possibility of direct link between price volatility and leverage. Small firms that are not supposed to be highly diversified in their operations, so financial institutions and investors are also less interested in these types of firms and they are less interested in the analysis of stocks of these small firms. This could cause stocks of small firms less informed in the market and more illiquid. It leads to greater price volatility of their stocks (Nazir et al., 2010).

Bustani et al. (2021) examined the effect of earning per share (EPS), price to book value (PBV), dividend payout ratio (DPR), and net profit margin (NPM) on the stock price in Indonesia Stock Exchange. The findings revealed a significant effect of earning per share, price to book value, and dividend payout ratio on stock prices. Hidayat (2021) examined return on assets (ROA), net profit margin (NPM), earning per share (EPS), share prices at conventional banks listed on the Indonesia Stock Exchange. The study found a positive relationship between earnings per share and share price. Safitri et al. (2020) determined the effect of debt-to-equity ratio, price earnings ratio, earnings per share on stock prices in the banking sector companies listed in InfoBank15 index. The result showed that the price earnings ratio and earnings per share have a positive and significant impact on the price of shares. Anwar (2019) analyzed the effect of returns on equity (ROE), earnings per share (EPS), and price-earnings ratio (PER) on stock prices (SP) of 14 companies listed on Indonesia Stock Exchange. The study found that there is no relationship between price earnings ratio and share price.

Dalimunthe and Lestari (2019) determined the effect of inflation and the equity price index on the net asset value of the Islamic Fixed Income Mutual Funds registered with the Financial Services Authority. The results showed that inflation has a negative and significant impact on the net asset value. Similarly, Gursida (2018) determined the influence of inflation rate, interest rate, and money supply on LQ45 stock price. The study found that inflation and interest rate during 2010 to 2016 does not affect the stock price but the money supply has had a significant influence on stock price. Moreover, Akbar and Afiezan (2018) analyzed the influence of corporate fundamental and macroeconomic factors on Islamic stock prices listed in Jakarta Islamic Index. The study found that the interest rate has no significant effect on stock prices. Furthermore, Sinaga and Hasanuh (2020) determined the effect of return on assets and price earnings ratio on stock prices of companies listed on the Indonesia Stock Exchange. The study found that return on assets and price earnings ratio have a significant effect on shares prices. Rusdiyanto et al. (2020) examined the effect of earning per share, debt to equity ratio and return on assets on stock prices on manufacturing companies listed on Indonesia Stock Exchange. The results of this study explained that earnings per share have a positive effect on stock prices.

Tsoukalas and Sil (1999) investigated the impact of dividend/price ratio and dividend growth on the share prices movements of UK stock market. The study found that dividend/price ratio predicts real stock returns for the UK stock market. The study showed that there was a strong relationship between real stock returns and dividend yields. Irfan and Nishat (2002) attempted to explain the price changes due to the six fundamental variables (dividend yield,



pay-out ratio, size of the firm, leverage, earnings volatility and asset growth). The empirical findings revealed that that prime key fundamental factors have no significant influence on the share price deviation in Pakistan. Sen and Ray (2003) examined the key determinants of stock price in India. The empirical study revealed dividend pay-out was an important factor affecting stock prices. The study also found earnings per share has a very weak impact on the share prices. Hartono (2004) examined the impact of dividend and earnings on stock prices. The study stated that if positive earnings information occurs after negative dividend information, then it has a significant positive impact on equity prices. Al-Deehani (2005) examined the determinants of share price for companies listed on Kuwait Stock Exchange. The findings showed that previous earnings per share, cash dividends per share, previous cash dividends per share, return on equity, price to book value ratio, previous cash flow per share and cash flow per share are all highly correlated with the share price.

Sharma and Singh (2006) analyzed the determinants of equity share price in Indian corporate sector. The study found that earnings per share, price-earnings ratio, dividend per share, dividend coverage, dividend payout, book value per share, and firm size are the significant determinants of share prices. Somoye et al. (2009) examined the factors influencing equity prices in the Nigerian stock market. The empirical results showed dividend per share, earnings per share and GDP exerts positive correlation with stock prices but are not significant determinants of share price. Al-Shubiri (2010) investigated the determinants of market stock price movements of Jordanian commercial banks. The empirical findings showed a highly positive significant relationship between market price of stock and net asset value per share, market price of stock dividend percentage and GDP. Similarly, the study showed negative significant relationship of inflation and lending interest with market price of stock. Nirmala and Sanju (2011) assessed the determinants of share prices in Indian stock market. The empirical findings showed that dividend per share and price earnings ratio have positive influence on share price of all three sectors. Sharma (2011) examined the empirical relationship between equity share prices of different industry groups and explanatory variables such as book value per share, dividend per share, earning per share, price earnings ratio, dividend yield, dividend pay-out, size in terms of sale and net worth. The results revealed that earnings per share, dividend per share and book value per share have significant impact on the equity price of different industry groups in India. Uddin (2009) analysed the relationship of microeconomic factors with the stock price by using multiple regression analysis. The study found a significant relationship among market return and some microeconomic factors such as net asset value per share, dividend percentage, earning per share of bank leasing, and insurance companies. In addition, Rialdy (2019) assessed the influence of return on equity, price earnings ratio and capital structure of the company's share price against the sub sectors of transport registered in Indonesia stock exchange. The study found that the price earnings ratio has positive effect on the stock price of the company.

In the context of Nepal, Amatya (2016) determined the impact of firm specific and macroeconomic variables on market price of share and firm performance of Nepalese commercial banks consisting both bank specific and macro-economic factors. The study found that there is positive relationship of market price per share with return on assets, dividend per share, earning per share, price earnings ratio and gross domestic product. Sapkota (2014) examined the determinants of share price of Nepalese commercial banks. The study found that earning per share, dividend per share, price earnings ratio, return on assets and gross domestic product have significant positive impact on market price per share. Likewise, Baral and Pradhan (2018) examine the impact of dividend policy on the share price of commercial bank in Nepal. The study found a positive relationship between dividend policy and market price per share in Nepal. 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. Sapkota and Pradhan (2016) analysed the determinants of share price of Nepalese commercial banks. The study concluded that EPS, DPS, P/E ratio, leverage, ROA and GDP have significant effect on MPS in the context of Nepalese commercial banks. Similarly, Niroula (2021) examined the behavior of stock price in Nepalese commercial banks. The result indicated that there is a positive and statistically significant effect of EPS, PE ratio and size of banks on MPS. Moreover, Wagle (2021) assessed the determinants of the stock market price in commercial banks. The study found that firm's market to book, price earnings and earnings yield proportion have significant positive association with the stock market price.

The above discussion shows that empirical evidences vary greatly across the studies concerning the factors determining market stock price movement. 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 identify the determinants of market stock price movements in Nepalese commercial banks. Specifically, it examines the relationship of earnings per share, price earnings ratio, dividend per share, inflation, lending rate and return on assets with market price per share and change in market price per share of Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on secondary data which were gathered from 21 commercial banks from 2013/14 to 2020/21, leading to a total of 168 observations. The study used stratified sampling method to select the banks. The main sources of data include bank supervision report published by Nepal Rastra Bank 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 banks                         | Study period    | Observations |
|-------------------------------------|---------------------------------------|-----------------|--------------|
| 1                                   | Nabil Bank Limited                    | 2013/14-2020/21 | 8            |
| 2                                   | Nepal Bangladesh Bank Limited         | 2013/14-2020/21 | 8            |
| 3                                   | Himalayan Bank limited                | 2013/14-2020/21 | 8            |
| 4                                   | Laxmi Bank Limited                    | 2013/14-2020/21 | 8            |
| 5                                   | Everest Bank Limited                  | 2013/14-2020/21 | 8            |
| 6                                   | Bank of Kathmandu Limited             | 2013/14-2020/21 | 8            |
| 7                                   | Agricultural Development Bank Limited | 2013/14-2020/21 | 8            |
| 8                                   | Standard Chartered Bank Nepal Limited | 2013/14-2020/21 | 8            |
| 9                                   | NIC Asia Bank Limited                 | 2013/14-2020/21 | 8            |
| 10                                  | Nepal SBI Bank Limited                | 2013/14-2020/21 | 8            |
| 11                                  | Nepal Investment Bank Limited         | 2013/14-2020/21 | 8            |
| 12                                  | Civil Bank Limited                    | 2013/14-2020/21 | 8            |
| 13                                  | Siddhartha Bank Limited               | 2013/14-2020/21 | 8            |
| 14                                  | Sanima Bank Limited                   | 2013/14-2020/21 | 8            |
| 15                                  | Citizens Bank International Limited   | 2013/14-2020/21 | 8            |
| 16                                  | Nepal Bank Limited                    | 2013/14-2020/21 | 8            |
| 17                                  | Century Commercial Bank Limited       | 2013/14-2020/21 | 8            |
| 18                                  | Prime Commercial Bank Limited         | 2013/14-2020/21 | 8            |
| 19                                  | Mega Bank Nepal Limited               | 2013/14-2020/21 | 8            |
| 20                                  | NMB bank Limited                      | 2013/14-2020/21 | 8            |
| 21                                  | Prabhu Bank Limited                   | 2013/14-2020/21 | 8            |
| <b>Total number of observations</b> |                                       |                 | <b>168</b>   |

Thus, the study is based on the 168 observations.

## The model

The econometric models employed in this study tries to analyze the impact of factors determining stock price of the Nepalese commercial banks. The dependent variables selected for the study are market price per share and change in market price per share. Similarly, the selected independent variables are earnings per share, price earnings ratio, dividend per share, inflation, lending rate and return on assets. The following regression model is used in the study to examine the impact of factors determining stock price of selected Nepalese commercial banks.

$$\text{Market stock price movement} = f(\text{EPS, PE, DPS, INF, LR and ROA})$$

More specifically, the given model has been segmented into following models:

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

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

Where,

- 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.
- CMPS = Change in market price as measured by change in price plus dividend by previous year's price, in Rs.
- EPS = Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rs.
- PE = Price earnings ratio as measured by the company's market price per share by the earning per share, in times.
- DPS = Dividend per share as measured by the company's total dividend paid by the total number of shares outstanding, in Rs.
- INF = Inflation measured as measured by the change in consumer price index, in percentage.
- LR = Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage.
- ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.

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

## Earnings per share

Earnings per share describe the company's profit per outstanding share of stock. Al-Tamimi et al. (2011) analyzed the factors determining stock prices in UAE stock market. The study found that there is positive impact of earnings per share on the stock price. Similarly, Adekunle et al. (2015) 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. In addition, Arshad et al. (2015) examined the determinants of share prices for the listed commercial banks in Karachi stock exchange. The study found that there is a significant positive relationship between earnings per share and stock price. Moreover, Agnihotri et al. (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 earnings per share, dividend per share and price earnings ratio are positively correlated to the stock price of many companies of different sectors. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between earnings per share and market stock price movement.

## Price earnings ratio

Price earnings ratio helps to determine whether the stock is overvalued or undervalued in comparison with its earning. Mondal and Imran (2010) analyzed the factors determining the share price of companies listed in Dhaka stock exchange through primary data collected from 55 investors. The study found that dividend, market capital, price earnings ratio, earning per share, net income, return on investment and retained earnings positively influence the stock prices. Similarly, 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. In addition, Almumani (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. Furthermore, 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. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between the price earnings ratio and market stock price movement.

## Dividend per share

Dividend per share is the amount that a company pay back to its investors in form 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. Moreover, Menike and Prabath (2014) examined the impact of dividend per share, earnings per share, and book value per share on stock price with a sample size of 100 companies from Colombo stock Exchange (CSE). 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. In addition, 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 a negative impact on stock price of selected companies in India. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a negative relationship between dividend per share and market stock price movement.

## Inflation

Inflation refers to the rate of increase in prices over a given period of time. 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 the stock price of 350 Islamic stock. 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<sub>4</sub>: There is a positive relationship between the inflation 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. Humpe and Macmillan (2009) examined the influence of macroeconomic variables on stock prices in US and Japan. The study showed that long term lending rate has a negative influence on stock price. Similarly, Lashkary et al. (2013) analysed the correlation between exchange rate volatility, stock price and lending behavior of banking system in Maskan bank during 1991-2011. The study found that lending interest rate of Maskan bank negatively influence the stock price. Moreover, Amarasinghe (2015) investigated 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. Furthermore, Alam and Uddin (2009) analyzed 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 suggested that there is a negative influence of interest rate on stock price. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a negative relationship between the lending rate and market stock price movement.

## Return on assets

Return on assets is a profitability ratio measured by the ratio of net profit to total assets. Return on assets shows how efficiently company is able used its total assets to generate the profit. Gursida (2017) investigated the effect of fundamental and macroeconomic analysis on stock price on Indonesia Stock exchange for the period of year 2011-2015. The study concluded that return on assets has a significant positive impact on stock price. Similarly, Khan and Shamim (2017) examined the factors influencing stock returns in Karachi Stock Exchange (KSE) of 30 listed companies from 15 sectors for the period from January 2008 to December 2012. The study found that return on assets has a significant positive impact on stock return. Idawati and Wahyudi (2015) investigated the influence of earning per share and return on assets on stock price of Indonesia Stock Exchange. The study suggested that the return on assets has a positive relationship with the stock price. Moreover, Har and Ghafar (2015) analyzed the impact of accounting earnings on stock return of Malaysia's plantation industry. The study suggested that the return on assets and return on capital employed have significant positive relationship with stock return only during the economic period prior to a recession. Furthermore, Hayati et al. (2020) analyzed the influence of the financial ratio on stock prices in Sharia-Based manufacturing companies in the Indonesia Stock Exchange for the period from 2014-2018. The study concluded that return on assets has a significant positive influence on stock prices. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between the lending rate 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 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 21 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are 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) and CMPS (Change in market price as measured by change in price plus dividend by previous year's price, in Rs). 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), PE (Price earnings ratio as measured by the company's market price per share by the earning per share, in times), DPS (Dividend per share as measured by the company's total dividend paid by the total number of shares outstanding, in Rs), INF (Inflation measured as measured by the change in consumer price index, in percentage), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

| Variables   | Minimum | Maximum | Mean   | Std. Deviation |
|-------------|---------|---------|--------|----------------|
| <b>MPS</b>  | 139     | 3600    | 632.79 | 576.18         |
| <b>CMPS</b> | -2032   | 1657    | -3.92  | 408.13         |
| <b>EPS</b>  | -15.24  | 86.04   | 26.55  | 15.13          |
| <b>PE</b>   | -13.58  | 78.33   | 23.20  | 11.57          |
| <b>DPS</b>  | 0       | 105.26  | 19.28  | 14.39          |
| <b>INF</b>  | 4.19    | 9.9     | 6.03   | 2.22           |
| <b>LR</b>   | 2.48    | 15.03   | 9.10   | 2.72           |
| <b>ROA</b>  | -1.44   | 3.33    | 1.53   | 0.52           |

#### 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 21 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are 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) and CMPS (Change in market price as measured by change in price plus dividend by previous year's price, in Rs). 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), PE (Price earnings ratio as measured by the company's market price per share by the earning per share, in times), DPS (Dividend per share as measured by the company's total dividend paid by the total number of shares outstanding, in Rs), INF (Inflation measured as measured by the change in consumer price index, in percentage), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

| Variables   | MPS     | CMPS  | EPS | PE | DPS | INF | LR | ROA |
|-------------|---------|-------|-----|----|-----|-----|----|-----|
| <b>MPS</b>  | 1       |       |     |    |     |     |    |     |
| <b>CMPS</b> | 0.294** | 1     |     |    |     |     |    |     |
| <b>EPS</b>  | 0.738** | 0.135 | 1   |    |     |     |    |     |

|            |         |         |         |          |         |          |       |   |
|------------|---------|---------|---------|----------|---------|----------|-------|---|
| <b>PE</b>  | 0.595** | 0.235** | 0.096   | 1        |         |          |       |   |
| <b>DPS</b> | 0.743** | 0.024   | 0.659** | 0.336**  | 1       |          |       |   |
| <b>INF</b> | 0.424** | 0.470** | 0.292** | 0.367**  | 0.196*  | 1        |       |   |
| <b>LR</b>  | -0.184* | -0.089  | -0.092  | -0.260** | -0.068  | -0.448** | 1     |   |
| <b>ROA</b> | 0.161*  | 0.025   | 0.409** | -0.112   | 0.287** | 0.013    | 0.075 | 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 earnings per share and market price per share. It indicates that higher the earnings per share, higher would be the market price per share. Similarly, there is a positive relationship between price earnings ratio and market price per share. It indicates that higher the price earnings ratio, higher 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. Moreover, there is a negative relationship between lending rate and market price per share. It indicates that higher would be the lending rate, lower would be the market price per share. Furthermore, there is a positive relationship between return on assets and market price per share. It indicates that higher the return on assets, higher would be the market price per share.

On the other hand, the result also shows that 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. 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. 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. Furthermore, there is a positive relationship between return on assets and change in market price per share. It indicates that higher the return on assets, higher 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. More specifically, it shows the regression results of earnings per share, price earnings ratio, dividend per share, inflation, lending rate, return on assets on market price per share of Nepalese commercial banks.



**Table 01:** Estimated regression results of Earnings per share, price earnings ratio, dividend per share, inflation, lending rate, return on assets on market price per share

The results are based on panel data of 21 commercial banks with 168 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $MPS_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 PE_{it} + \beta_3 DPS_{it} + \beta_4 INF_{it} + \beta_5 LR_{it} + \beta_6 ROA_{it} + e_{it}$ , 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 company's total earnings by the total number of shares outstanding, in Rs), PE (Price earnings ratio as measured by the company's market price per share by the earning per share, in times), DPS (Dividend per share as measured by the company's total dividend paid by the total number of shares outstanding, in Rs), INF (Inflation measured as measured by the change in consumer price index, in percentage), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

| Models | Intercepts             | Regression coefficients of |                      |                      |                      |                     |                      | Adj. R_bar2 | SEE     | F-value |
|--------|------------------------|----------------------------|----------------------|----------------------|----------------------|---------------------|----------------------|-------------|---------|---------|
|        |                        | EPS                        | PE                   | DPS                  | INF                  | LR                  | ROA                  |             |         |         |
| 1      | -113.233<br>(1.859)    | 28.095<br>(14.089)**       |                      |                      |                      |                     |                      | 0.541       | 390.000 | 198.512 |
| 2      | -54.577<br>(0.678)     |                            | 29.623<br>(9.538)**  |                      |                      |                     |                      | 0.350       | 464.482 | 90.981  |
| 3      | 59.097<br>(1.183)      |                            |                      | 29.762<br>(14.317)** |                      |                     |                      | 0.551       | 386.586 | 204.980 |
| 4      | -31.231<br>(0.266)     |                            |                      |                      | 110.142<br>(6.031)** |                     |                      | 0.170       | 523.415 | 36.373  |
| 5      | 987.04<br>(6.441)**    |                            |                      |                      |                      | -38.948<br>(2.412)* |                      | 0.031       | 568.045 | 5.824   |
| 6      | 360.333<br>(2.629)**   |                            |                      |                      |                      |                     | 177.687<br>(2.099)*  | 0.022       | 570.395 | 4.416   |
| 7      | -673.533<br>(13.021)** | 26.168<br>(20.843)**       | 26.352<br>(16.05)**  |                      |                      |                     |                      | 0.821       | 244.433 | 381.471 |
| 8      | -630.906<br>(12.977)** | 20.633<br>(13.191)**       | 23.201<br>(14.198)** | 9.206<br>(5.296)**   |                      |                     |                      | 0.850       | 226.568 | 305.352 |
| 9      | -686.603<br>(12.097)** | 19.724<br>(12.120)**       | 21.958<br>(12.521)** | 9.673<br>(5.548)**   | 16.534<br>(1.864)    |                     |                      | 0.851       | 224.879 | 233.333 |
| 10     | -515.680<br>(5.333)**  | 21.933<br>(13.599)**       | 22.473<br>(13.305)** | 9.607<br>(5.580)**   |                      | -2.045<br>(0.309)   | 103.812<br>(2.807)** | 0.850       | 222.609 | 191.361 |
| 11     | -765.590<br>(7.133)**  | 19.714<br>(12.105)**       | 22.143<br>(12.525)** | 9.615<br>(5.506)**   | 19.712<br>(2.052)*   | -6.257<br>(0.867)   |                      | 0.854       | 225.050 | 186.537 |
| 12     | -641.322<br>(5.609)**  | 21.007<br>(12.635)**       | 21.433<br>(12.238)** | 10.005<br>(5.827)**  | 18.955<br>(2.013)*   | -7.447<br>(1.051)   | 101.674<br>(2.774)** | 0.852       | 220.540 | 163.152 |

**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 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). Similarly, 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). Likewise, 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). Furthermore, 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). Likewise, 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 return on assets are positive with market price per share. It indicates that return on assets has a positive impact on market price per share. This finding is consistent with the findings of Idawati and Wahyudi (2015).

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

**Table 5:** Estimated regression results of earnings per share, price earnings ratio, dividend per share, inflation, lending rate, return on assets on change in market price per share

The results are based on panel data of 21 commercial banks with 168 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $CMPS_i = \beta_0 + \beta_1 EPS_i + \beta_2 PE_i + \beta_3 DPS_i + \beta_4 INF_i + \beta_5 LR_i + \beta_6 ROA_i + e_i$ , where the dependent variable is CMPS (Change in market price as measured by change in price plus dividend by previous year's price, in Rs). 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), PE (Price earnings ratio as measured by the company's market price per share by the earning per share, in times), DPS (Dividend per share as measured by the company's total dividend paid by the total number of shares outstanding, in Rs), INF (Inflation measured as measured by the change in consumer price index, in percentage), LR (Lending rate as measured by the interest rate that a bank charges the interest as against the loan provided, in percentage), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage).

| Models | Intercepts                       | Regression coefficients of   |                                |                              |                     |                     |                   | Adj. R_bar2 | SEE     | F-value |
|--------|----------------------------------|------------------------------|--------------------------------|------------------------------|---------------------|---------------------|-------------------|-------------|---------|---------|
|        |                                  | EPS                          | PE                             | DPS                          | INF                 | LR                  | ROA               |             |         |         |
| 1      | -100.816<br>(1.592)              | 3.649<br>(1.760)             |                                |                              |                     |                     |                   | 0.013       | 405.591 | 3.101   |
| 2      | -196.546<br>(2.851)**            |                              | 8.302<br>(3.121)**             |                              |                     |                     |                   | 0.050       | 397.852 | 9.742   |
| 3      | -16.874<br>(0.319)               |                              |                                | 0.672<br>(0.305)             |                     |                     |                   | 0.010       | 409.242 | 0.091   |
| 4      | -525.596<br>(6.493)**            |                              |                                |                              | 86.532<br>(6.864)** |                     |                   | 0.220       | 361.282 | 47.120  |
| 5      | 117.438<br>(1.068)               |                              |                                |                              |                     | -13.342<br>(1.151)  |                   | 0.002       | 407.732 | 1.330   |
| 6      | -34.151<br>(0.347)               |                              |                                |                              |                     |                     | 19.718<br>(0.325) | 0.012       | 409.227 | 0.110   |
| 7      | -269.169<br>(3.209)**            | 3.07<br>(1.508)              | 7.918<br>(2.974)**             |                              |                     |                     |                   | 0.060       | 396.334 | 6.043   |
| 8      | -303.031<br>(3.616)**            | 7.467<br>(2.77)**            | 10.421<br>(3.7)**              | 7.314<br>(2.441)             |                     |                     |                   | 0.080       | 390.510 | 6.140   |
| 9      | -565.621                         | 3.181                        | 4.561                          | 5.112                        | 77.953              |                     |                   | 0.221       | 359.830 | 12.961  |
| 10     | (6.228)**<br>-317.468<br>(1.861) | (1.222)<br>7.217<br>(2.536)* | (1.625)<br>10.513<br>(3.527)** | (1.832)<br>7.372<br>(2.427)* | (5.492)**           | -0.954<br>(0.082)   | 18.757<br>(0.287) | 0.072       | 392.809 | 3.662   |
| 11     | -885.399<br>(5.221)**            | 3.141<br>(1.221)             | 5.312<br>(1.902)               | 5.348<br>(1.938)             | 90.818<br>(5.985)** | -25.331<br>(2.222)* |                   | 0.240       | 355.560 | 11.612  |
| 12     | -920.872<br>(4.984)**            | 2.772<br>(1.031)             | 5.515<br>(1.948)               | 5.459<br>(1.968)             | 91.033<br>(5.983)** | -24.992<br>(2.183)* | 29.023<br>(0.490) | 0.243       | 356.397 | 9.670   |

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

Table 5 shows that 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). Similarly, 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). Likewise, the beta coefficients for dividend per share are positive 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 contradicts with the findings of Srinivasan (2012). Furthermore, 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). Likewise, 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). Similarly, the beta coefficients for return on assets are positive with change in market price per share. It indicates that return on assets has a positive impact on change in market price per share. This finding is consistent with the findings of Har and Ghafar (2015).

## 4. Summary and conclusion

Security market is one of the constituents of capital market. It has a significant role to the development of capital market as well as overall economy. A stock market is a financial market where the securities are bought and sold and also regarded as a long-term source of funding. The stock price of a company reflects the value of the company for the investors so that high stock prices attract the attention of investors to invest capital in the company. Stock market is a very important economic institution that plays a crucial role in the economy. Stock markets are essential for economic growth as they insure the flow of resources to the most productive investment opportunities.

This study attempts to examine the determinants of market stock price movement of Nepalese commercial banks. The study is based on secondary data of 21 commercial banks with 168 observations for the period from 2013/14 to 2020/21.

The study showed that earnings per share, price earnings ratio, dividend per share, inflation and return on assets have positive impact on market stock price movement. However, lending rate has negative impact on market stock price movement. The study concluded that dividend per share followed by earnings per share and price earnings ratio is the most influencing factor that explain the changes in the market price per share of Nepalese commercial banks. The study also concluded that inflation followed by price earnings ratio and earnings per share is the most influencing factor that explain the changes in fluctuation in the market price per share in Nepalese commercial banks.

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## Abstract

*This study examines the effect of macro-economic variables on stock return of Nepalese commercial banks. Market price per share and stock return are selected as the dependent variables. Similarly, gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 128 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic variables on stock return of Nepalese commercial banks.*

*The study showed that gross domestic product has a positive impact on stock return and market price per share. It indicates that the increase in gross domestic product leads to increase in stock return and market price per share. Similarly, the study showed that money supply has a positive impact on stock return and market price per share. It means that increase in money supply leads to increase in stock return and market price per share. Moreover, the study also showed that bank rate has a negative impact on stock return. It indicates that the increase in bank rate leads to decrease in stock return. Furthermore, exchange rate has a negative impact on market price per share. It indicates that the increase in bank rate leads to decrease in market price per share. Likewise, unemployment rate has a negative impact on market price per share. It indicates that the increase in unemployment rate leads to decrease in market price per share.*

**Key words:** Stock return, market price per share, gross domestic product, inflation rate, exchange rate, money supply, bank rate and unemployment rate.



# 1. Introduction

The development of the capital markets is crucial for the development of a real sector in the system and the wellbeing of any economy. Stock market plays a key role in the mobilization of capital in any countries, leading to the growth of industry and commerce of the country (Rousseau and Wachtel, 2000). The capital market is considered as a barometer of an economy. Many factors can be a signal to the stock market participant to expect higher or lower returns when investing in stock. One of these factors are macroeconomic variables. The changes in economic variables can significantly influence stock price returns. Therefore, there is a causal relationship between macroeconomic variables and stock market return (Maysami *et al.*, 2004).

An efficient stock market may induce investment opportunities by identifying investment worthy projects that may ultimately promote economic activity, minimize and diversify risk to the greatest extent and expedite the exchange of goods and services (Mishkin, 2001). The stock market causes an increase in economic growth by increasing the liquidity of the financial assets, encouraging and promoting investment, and diversifying the global and domestic risk that increases the value of shareholders and in turn influences corporate governance. The stock markets also help in explaining future economic activity and describing the actual cause and affect between the future economic growth and the stock prices (Caporale *et al.*, 2004).

Hou and Cheng (2010) found that stock market capitalization contribution to economic growth is substantially large and statistically significant in Taiwan. On the other hand, the study found that economic growth promotes stock market development. Wong and Zhou (2011) found a positive and a statistically significant effect between stock market size and economic growth. On another level, the size of stock market increases with more increase in liquidity, which both in turn spur economic growth (Masoud and Hardaker, 2012). Wang and Ajit (2013) showed a negative effect of stock market capitalization on economic growth and point to the fact that if stock markets are not positively contributing to economic growth, then they are mainly administratively driven markets. It is expected that stock markets will affect the economy through stock market liquidity, more liquid stock markets ease investment processes in the long-run and improve capital allocation and expectations for long-term growth (Levine and Zervos, 1996). A large stock market as indicated by its capitalization is not necessarily a liquid market. High turnover usually indicates low transaction costs which in turn enhances allocative efficiency of the stock market and consequently promote economic growth. Levine and Zervos (1998) found that stock market liquidity is a strong predictor for real per capital GDP growth, growth of physical capital and growth of productivity, both in current and long-term economic growth. Faisal *et al.* (2016) examined the dynamic relationship between gross domestic product (GDP), stock prices, foreign direct investment and domestic credit to the private sector for China by using the autoregressive distributed lag (ARDL) approach. The study confirmed the long-run cointegration among the variables. The empirical results revealed that stock prices and the associated regressors are in a long-term equilibrium relationship. Likewise, the study also found a bi-directional causality between financial development and stock prices.

Aretis *et al.* (2001) assessed the relationship between stock market development and economic growth utilizing Granger Causality and cointegration techniques. For Germany, the results showed that there is a negative correlation between economic growth and banking development. Meanwhile, the results for Japan also showed a negative association between economic growth, banking development and the stock market. The study further exhibited that banking development and stock market combined contribute to economic growth, where banking development has a significant contribution to real gross domestic



product (GDP) compared to the stock market. Moreover, Rioja and Valev (2014) analyzed how stock markets and banks are affected by economic growth and generation of capital using generalized method of moments (GMM) model. The results revealed that banks have an effect on capital growth while stock markets had an effect on productivity. The study further revealed that in countries with minimum income, credit in banks is the main source of economic growth and that stock markets do not significantly influence either productivity growth or capital accumulation. In addition, Naceur et al. (2008) examined the correlation of stock markets, banks, and economic growth in the MENA region. The findings showed no significant correlation between stock markets, banks and economic growth. When controlled for stock market development, the results further showed that there is an inverse association between economic growth and bank development. Similarly, Dritsaki and Melina (2005) employed a trivariate VAR model to analyze the relationship between stock and credit markets with economic growth in Greece. Using monthly time series data, the study showed a positive causality between stock market and economic development, and a negative causality between banking improvement and economic growth. Tursoy and Faisal (2016) examined the relationship between GDP and stock price in Turkey using ARDL model. The findings suggested a bidirectional long-run and joint short-run and long-run causality. Furthermore, a unidirectional causality was found that runs from GDP to stock price. Moreover, Demirguc-Kent and Levine (1996) analyzed 18 countries utilizing the correlation rank technique and found that a progressive correlation exists between stock market developments and economic growth.

Toraman and Basarir (2014) examined the relationship between interest rate and stock market within the framework of real gross domestic product (RGDP) for Turkey for the period 1998-2012 using VAR estimation techniques. The result showed that a convincing long run relationship exist between stock market development and interest rate. The study also observed that crisis in the stock market is precluded with the control of interest rate in the long run. For the UK economy, Florackis *et al.* (2014) investigated whether stock market behavior exert on the interest rate and the RGDP among other variables. The results showed that a negative but significant relationship exist between the stock prices illiquidity and the future GDP growth. In addition, Marfatia (2014) documented the existence of a negative but significant relationship between the level of uncertainty and the time varying response of S&P 500 stock returns to unanticipated changes in the interest rate induced by unanticipated changes in the monetary policy decision for the US economy. For India, Andries et al. (2014) assessed the pattern of co-movement among interest rate, stock price returns and exchange rate for the period 1997-2010. The study observed that there is a link that connects the three variables with the stock market movement lagging behind both exchange rate and interest rate fluctuation, while interest rate plays the leading role in the co-movement.

Moya-Martinez *et al.* (2014) documented the existence of a significant relationship between interest rate changes and stock market prices for the Spanish economy using a wavelet-based approach. The study further revealed that long term investors are more concerned with interest rate movement and that the fluctuations in the macroeconomic variables when taking investment decisions. Similarly, Jedida *et al.* (2014) used autoregressive distributed lag estimation techniques to analyze the relationship between financial development proxied by both stock market development and bank credit allocation; and economic growth. Though, the study documented the existence of a bi-lateral relationship between credit allocation and economic growth, it observed that stock market development has no positive impact on economic growth for Tunisia. Moreover, Sensoy and Sobaci (2014) examined the correlations between exchange rate, interest rate and stock market development in Turkey. The study observed that volatility shocks provoke abrupt changes in the dynamic correlations in the short run with effect in the long run. Likewise, Bekhet and Matar (2013) used ARDL bound testing techniques to establish a functional relationship between

stock market and economic growth proxied by real GDP or industrial production growth rate and interest rate alongside other macroeconomic variables for Jordan economy. For Finland, Petri and Vataja (2011) observed a bi-directional causality between stock market returns and interest rate. The study reported that during a crisis-free period, interest rate grangers cause fluctuation in stock prices, while the latter granger causes the former in the period of turbulent. Furthermore, Hsing (2011) documented that stock market is negatively influenced by changes in interest rate, thus lowering interest rate will serve as a boost to the stock prices. In addition, Ologunde et al. (2006) showed a significant and positive relationship exist between interest rate and stock market capitalization rate. The study further revealed that government development stock rate has a negative influence on stock market capitalization rate, though the prevailing interest rate exerts negatively on government development stock rate.

In the context of Nepal, Karki (2018) revealed that the macroeconomic variables do not explain the variation in stock price in the long-run. The study revealed that there is positive and significant relationship of stock market price with GDP, inflation and money supply. Shrestha and Subedi (2014) concluded that stock market has a strong positive relationship between inflation and growth of money supply. Phuyal (2016) found long run relationship between macroeconomic variables and the stock market performance in Nepal. Bhattarai (2014) examined the determinants of share price of Nepalese commercial banks. The study revealed that earnings per share has a significant positive association with share price and stock return.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of macro-economic variables on stock returns of 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 main purpose of the study is to analyze the effect of macro-economic variables on stock return of Nepalese commercial banks. Specifically, it examines the relationship of gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate with stock return and market price per share of Nepalese commercial banks.

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

## **2. Methodological aspects**

The study is based on the secondary data which were gathered from 16 commercial banks out of 27 commercial banks on the basis of market capitalization for the period from 2013/14 to 2020/21, leading to a total of 128 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|-------------------------------------|---------------------------------------|-------------------|--------------|
| <b>Public Banks</b>                 |                                       |                   |              |
| 1                                   | Nepal Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 2                                   | Agricultural Development Bank Limited | 2013/14 - 2020/21 | 8            |
| <b>Joint Venture Banks</b>          |                                       |                   |              |
| 3                                   | Nabil Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 4                                   | NMB Bank Limited                      | 2013/14 - 2020/21 | 8            |
| 5                                   | Everest Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 6                                   | Himalayan Bank Limited                | 2013/14 - 2020/21 | 8            |
| <b>Private Banks</b>                |                                       |                   |              |
| 7                                   | NIC Asia Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 8                                   | Global IME Bank Limited               | 2013/14 - 2020/21 | 8            |
| 9                                   | Prime Commercial Bank Limited         | 2013/14 - 2020/21 | 8            |
| 10                                  | Nepal Investment Bank Limited         | 2013/14 - 2020/21 | 8            |
| 11                                  | Siddhartha Bank Limited               | 2013/14 - 2020/21 | 8            |
| 12                                  | Mega Bank Nepal Limited               | 2013/14 - 2020/21 | 8            |
| 13                                  | Prabhu Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 14                                  | Kumari Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 15                                  | Sanima Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 16                                  | Citizens Bank International Limited   | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                       |                   | <b>128</b>   |

Thus, the study is based on the 128 observations.

## The model

The model used in this study assumes that the bank's stock return depends upon macro-economic variables. The dependent variables selected for the study are stock return and market price per share. Similarly, the selected independent variables are gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate. Therefore, the model takes the following form:

$$\text{Stock return (SR)} = f(\text{INF, MS, UNEMP, GDP, ER, and BR})$$

More specifically, the given model has been segmented into the following models:

$$\text{SR}_{it} = \beta_0 + \beta_1 \text{INF}_{it} + \beta_2 \text{MS}_{it} + \beta_3 \text{UNEMP}_{it} + \beta_4 \text{GDP}_{it} + \beta_5 \text{ER}_{it} + \beta_6 \text{BR}_{it} + e_{it}$$

$$\text{MPPS}_{it} = \beta_0 + \beta_1 \text{INF}_{it} + \beta_2 \text{MS}_{it} + \beta_3 \text{UNEMP}_{it} + \beta_4 \text{GDP}_{it} + \beta_5 \text{ER}_{it} + \beta_6 \text{BR}_{it} + e_{it}$$

Where,

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

MPPS = Market price per share as measured by the share price of the bank determined by the demand and supply forces in the market, in Rupees.

GDP = Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion.

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

- ER = Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD.  
 MS = Money supply as measured by the broad money, USD in billion.  
 UNEMP = Annual unemployment rate, in percentage.  
 BR = Bank rate as measured by the lending cost of the bank, in percentage.

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

## Unemployment rate

Unemployment means the proportion of unemployed labor. Boyd et al. (2005) assessed the effect of unemployment announcements on stock prices. The results revealed that the rising unemployment can significantly affect the stock market. Similarly, Ozlen and Ergun (2012) examined the macroeconomic factors and stock returns. The study found that unemployment rate has a negative relationship with stock return. Furthermore, an increase in the unemployment rate leads to lowered total demand and increased loan default rate and the firm's profit will be at stake (Farsio and Fazel, 2013). Furthermore, Bordeleau and Graham (2010) argued that unemployment negatively influences bank performance. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a negative relationship between unemployment rate and stock return.

## Inflation

Inflation reflects a reduction in the purchasing power per unit of money. It is a loss of real value in the medium of exchange and unit of account within the economy. Udegbumam and Eriki (2001) revealed that there is a significant negative relationship between inflation rate and share price. Similarly, Gallagher and Taylor (2002) found that the stock returns are negatively affected by both expected and unexpected inflation. Moreover, Omotor (2010) revealed that the monetary authorities and policy makers should be more concerned about the changes in inflation rate due to its significant negative impact on stock price movements in Nigeria. Furthermore, Rifat (2015) found that inflation is negatively correlated to the yield on the stock. Similarly, Pole and Cavusoglu (2021) found that inflation rate has a negative relationship with stock return in the Nigerian stock exchange market. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a negative relationship between inflation and stock market return.

## Money supply

Money supply refers to the total volume of currency held by the public at a particular point in time. Homa and Jaffee (1971) found that the average price of stocks is positively correlated to the money supply. Similarly, Maysami and Koh (2000) revealed that money supply is positively related to stock market. Badarudin *et al.* (2013) found that there is a positive relationship between money supply and stock index returns. Likewise, Sohail and Hussain (2009) indicated that money supply has a significant positive effect on the stock returns in the long-run. Moreover, Nkechukwu et al. (2013) concluded that money supply has a positive and significant long-run effect on stock prices. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a positive relationship between money supply and stock market return.

## Gross domestic product

Chen *et al.* (1986) indicated that the relationship between stock market prices and gross domestic product in the U.S is positive and significant. Similarly, Ritter (2005) showed that there is a positive relationship between stock prices and economic growth. Likewise, Kim and In (2003) revealed that gross domestic product has a positive relationship with stock prices. Moreover, Cole *et al.* (2008) found that GDP has the positive impact on stock return. Likewise, Beck and Levine (2004) revealed that stock price is positively correlated to stock price. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a positive relationship between gross domestic product and stock return.

## Bank rate

Zaini *et al.* (2018) examined the effect of external and internal factors on stock return with price to book value as moderation variables in banking companies in Indonesia Stock Exchange. The study found that bank rate is negatively correlated to the yield on the stock. Likewise, Sofyani and Wahyudi (2015) found that bank rate has a negative and significant impact on the stock price index. Moreover, Lioui and Maio (2014) stated that there is a significant negative relationship between bank rates and stock prices. Furthermore, Ratanapakorn and Sharma (2007) found that long-term interest rate has a negative impact on stock return. Similarly, Khan *et al.* (2018) revealed that bank rate has a significant negative impact on stock return. Fama (1981) found that stock market return is negatively correlated to the expected inflation and bank rates. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a negative relationship between bank rate and stock market return.

## Exchange rate

Zaini *et al.* (2018) found that exchange rate is negatively related to the stock return. Similarly, Pole (2021) found that exchange rate has a negative impact on stock return. Likewise, Maharditya *et al.* (2018) examined the implication of macroeconomic factors to stock returns of Indonesian property and real estate companies. The results revealed that exchange rate has a negative impact on stock return. Moreover, Hardiningsih *et al.* (2001) showed that the exchange rate of Rupiah against US Dollar has a negative effect on the stock. Furthermore, Buyuksalvarci (2010) examined the effect of macroeconomic factors on stock return in Istanbul stock market in Turkey. The result showed that exchange rate has a significant negative effect on stock return. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a negative relationship between exchange rate and stock return.

## 3. Results and discussion

### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are MPPS (Market price per share as measured by the share price of the bank determined by the demand and supply forces in the market, in Rupees) and SR (Stock return defined as the sum of dividend yield and capital gain yield, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BR (Bank rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UNEMP (Annual unemployment rate, in percentage).

| Variables | Minimum | Maximum | Mean   | S. D.  |
|-----------|---------|---------|--------|--------|
| MPPS      | 163.00  | 3385.00 | 610.09 | 502.04 |
| SR        | -61.20  | 268.20  | 17.00  | 52.59  |
| GDP       | 20.00   | 34.27   | 28.81  | 5.67   |
| INF       | 3.60    | 9.93    | 6.15   | 2.22   |
| MS        | 75.36   | 135.76  | 98.83  | 17.83  |
| ER        | 98.30   | 118.20  | 107.78 | 6.94   |
| BR        | 5.00    | 8.00    | 6.69   | 1.09   |
| UNEMP     | 2.63    | 4.44    | 3.10   | 0.53   |

## 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 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are MPPS (Market price per share as measured by the share price of the bank determined by the demand and supply forces in the market, in Rupees) and SR (Stock return defined as the sum of dividend yield and capital gain yield, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BR (Bank rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UNEMP (Annual unemployment rate, in percentage).

| Variables | SR      | MPPS     | INF      | MS       | UNEMP    | GDP      | ER      | BR |
|-----------|---------|----------|----------|----------|----------|----------|---------|----|
| SR        | 1       |          |          |          |          |          |         |    |
| MPPS      | 0.165   | 1        |          |          |          |          |         |    |
| INF       | 0.360** | 0.374**  | 1        |          |          |          |         |    |
| MS        | 0.861   | 0.204*   | -0.530** | 1        |          |          |         |    |
| UNEMP     | 0.240** | -0.043   | -0.472** | 0.810**  | 1        |          |         |    |
| GDP       | 0.242** | 0.376**  | -0.802** | 0.734**  | 0.438**  | 1        |         |    |
| ER        | 0.044   | -0.247** | -0.540** | 0.906**  | 0.616**  | 0.848**  | 1       |    |
| BR        | -0.039  | 0.245**  | 0.507**  | -0.940** | -0.614** | -0.818** | 0.968** | 1  |

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

Table 3 shows that inflation rate is positively correlated to stock returns. It means that increase in inflation rate leads to increase in stock returns. Similarly, money supply has a positive relationship with stock returns.

It shows that increase in money supply leads to increase in stock returns. However, the study shows that there is a positive relationship between unemployment rate and stock returns. It means that increase in unemployment rate leads to increase in stock returns. In addition, there is a positive relationship between gross domestic product and stock returns. It means that increase in gross domestic product leads to increase in stock returns. Furthermore, there is a positive relationship between exchange rate and stock returns. It indicates that increase in exchange rate leads to increase in stock returns. Furthermore, bank rate has a negative relationship with stock returns. It indicates that increase in interest rate leads to decrease in stock returns.

Similarly, the result shows that inflation rate is positively correlated to market price per share. It indicates that increase in inflation rate leads to increase in stock returns. On the other hand, there is a positive relationship between money supply and market price per share. It indicates that increase in money supply leads to increase in market price per share. In addition, unemployment rate is negatively related to market price per share. It shows that increase in unemployment rate leads to decrease in market price per share. In addition, there is a positive relationship between gross domestic product and market price per share. It indicates that increase in gross domestic product leads to increase in market price per share. Besides, exchange rate has a negative relationship with market price per share. It means that increase in exchange rate leads to decrease in market price per share. However, there is a positive relationship between bank rate and market price per share. It means that increase in bank rate leads to increase in market price per share of Nepalese commercial banks.

## **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 gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate with stock return of Nepalese commercial banks.

**Table 4:** Estimated regression results of gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate on stock return of Nepalese commercial banks

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $SR = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 EXR + \beta_4 BR + \beta_5 MS + \beta_6 UNEMP + e_{it}$ , where, the dependent variable is SR (Stock return defined as the sum of dividend yield and capital gain yield, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BR (Bank rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UNEMP (Annual unemployment rate, in percentage).

| Model | Intercept              | Regression coefficients of |                  |                     |                    |                    |                   | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|------------------------|----------------------------|------------------|---------------------|--------------------|--------------------|-------------------|------------------------------------|-------|---------|
|       |                        | INF                        | MS               | UNEMP               | GDP                | EXR                | BR                |                                    |       |         |
| 1     | -35.201<br>(2.747)     | 8.493<br>(4.331)**         |                  |                     |                    |                    |                   | 0.123                              | 49.25 | 18.760  |
| 2     | -8.145<br>(0.310)      |                            | 0.254<br>(0.972) |                     |                    |                    |                   | 0.001                              | 52.60 | 0.945   |
| 3     | -57.238<br>(2.109)     |                            |                  | 23.957<br>(2.774)** |                    |                    |                   | 0.050                              | 51.25 | 7.694   |
| 4     | 81.583<br>(3.46) **    |                            |                  |                     | 2.24<br>(2.79)**   |                    |                   | 0.051                              | 51.23 | 7.808   |
| 5     | -19.32<br>(0.27)       |                            |                  |                     |                    | 0.337<br>(0.499)   |                   | 0.006                              | 52.74 | 0.249   |
| 6     | 29.40<br>(1.012)       |                            |                  |                     |                    |                    | -1.85<br>(0.433)  | 0.006                              | 52.75 | 0.19    |
| 7     | -1770.25<br>(4.915) ** | 13.306<br>(6.12)**         | 1.14<br>(4.18)** |                     |                    |                    |                   | 0.224                              | 46.32 | 19.34   |
| 8     | -0.694<br>(0.025)      |                            |                  | 42.72<br>(4.83) **  | 3.98<br>(4.84) **  |                    |                   | 0.194                              | 47.22 | 16.24   |
| 9     | -228.76<br>(6.48) **   | 14.097<br>(6.96) **        | -0.17<br>(0.442) | 56.71<br>(4.58) **  |                    |                    |                   | 0.331                              | 43.02 | 21.90   |
| 10    | -583.004<br>(1.653)    |                            |                  |                     | 9.24<br>(6.92) **  | 7.661<br>(3.047) * | -6.052<br>(0.412) | 0.263                              | 45.14 | 16.11   |
| 11    | -295.60<br>(4.492) **  | 17.59<br>(4.97) **         | 0.77<br>(1.227)  | 69.62<br>(4.25) **  | 2.27<br>(1.20)     |                    |                   | 0.331                              | 42.95 | 16.85   |
| 12    | -577.54<br>(1.67)      |                            |                  | 22.100<br>(2.27) *  | 8.63<br>(6.44) **  | 6.64<br>(2.64) *   | -8.882<br>(0.612) | 0.290                              | 44.40 | 13.78   |
| 13    | -573.66<br>(4.46) **   | 13.09<br>(3.36)**          | 1.89<br>(2.48) * | 70.11<br>(4.37) **  | 1.68<br>(0.69)     | 4.90<br>(2.50) *   |                   | 0.360                              | 42.06 | 15.30   |
| 14    | 84.90<br>(0.196)       |                            | 3.19<br>(2.47) * | 63.26<br>(3.29) **  | 8.608<br>(6.56) ** | 5.092<br>(2.003)   | -37.29<br>(1.59)  | 0.321                              | 43.51 | 12.70   |
| 15    | -69.47<br>(0.17)       | 12.52<br>(3.19) **         | 3.14<br>(2.51) * | 84.53<br>(4.30) **  | 1.97<br>(0.81)     | 2.84<br>(1.11)     | -28.74<br>(1.26)  | 0.363                              | 41.96 | 13.08   |

**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 inflation rate are positive with stock return. It indicates that the inflation rate has a positive impact on stock return. This finding is similar to the findings of Gallagher and Taylor (2002). Similarly, the beta coefficients for money supply are positive with stock return. It indicates that money supply has a positive impact on stock return. This finding is consistent with the findings of Badarudin et al. (2013). Likewise, the beta coefficients for unemployment rate are positive with stock return. It indicates that unemployment has a positive impact on stock return. This finding is similar to the findings of Ozlen and Ergun (2012). Likewise, the beta coefficients for gross domestic product are positive with stock return. It indicates that gross domestic product has a positive impact on stock return. This finding is consistent to the findings of Chen et al. (1986). Similarly, the beta coefficients for exchange rate are positive with stock return. It indicates that exchange has a positive impact on stock return. This finding is consistent with the findings of Hardiningsih et al. (2001). However, the beta coefficients for bank rate are negative with stock return. It indicates that bank rate has a negative impact on stock return. This finding is inconsistent with the findings of Khan et al. (2018).

Table 5 shows the estimated regression results of gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate on market price per share of Nepalese commercial banks.

**Table 5:** Estimated regression results of gross domestic product, inflation rate, money supply, exchange rate, bank rate and unemployment rate on market price per share

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $MPPS = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 EXR + \beta_4 BR + \beta_5 MS + \beta_6 UNEMP + e_i$ , where, the dependent variables is MPPS (Market price per share as measured by the share price of the bank determined by the demand and supply forces in the market, in Rupees). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BR (Bank rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UNEMP (Annual unemployment rate, in percentage).

| Model | Inter-cept            | Regression coefficients of |                  |                   |                    |                     |                     | Adj. R_bar <sup>2</sup> | SEE    | F-value |
|-------|-----------------------|----------------------------|------------------|-------------------|--------------------|---------------------|---------------------|-------------------------|--------|---------|
|       |                       | INF                        | MS               | UN-EMP            | GDP                | ER                  | BR                  |                         |        |         |
| 1     | 93.003<br>(0.77)      | 84.13<br>(4.52) **         |                  |                   |                    |                     |                     | 0.13                    | 467.54 | 20.43   |
| 2     | 1178.36<br>(4.78) **  |                            | 5.75<br>(2.34) * |                   |                    |                     |                     | 0.03                    | 493.40 | 5.49    |
| 3     | 737.49<br>(2.77) **   |                            |                  | -41.11<br>(0.49)  |                    |                     |                     | 0.006                   | 503.55 | 0.24    |
| 4     | 1569.700<br>(7.31) ** |                            |                  |                   | 33.31<br>(4.55) ** |                     |                     | 0.14                    | 467.05 | 20.74   |
| 5     | 2536.39<br>(3.76) **  |                            |                  |                   |                    | -17.87<br>(2.86) ** |                     | 0.05                    | 488.42 | 8.18    |
| 6     | -141.63<br>(0.53)     |                            |                  |                   |                    |                     | 112.41<br>(2.83) ** | 0.05                    | 488.72 | 8.01    |
| 7     | 123.92<br>(0.34)      | 83.08<br>(3.77) **         | 0.25<br>(0.93)   |                   |                    |                     |                     | 0.13                    | 469.39 | 10.14   |
| 8     | 1293.54<br>(4.77) **  |                            |                  | -143.38<br>(1.65) | 39.15<br>(4.84) ** |                     |                     | 0.15                    | 463.89 | 11.87   |

|    |                    |                    |                   |                      |                    |                  |                  |      |        |       |
|----|--------------------|--------------------|-------------------|----------------------|--------------------|------------------|------------------|------|--------|-------|
| 9  | -227.29<br>(0.60)  | 88.45<br>(4.12) ** | 9.100<br>(2.26) * | -385.01<br>(2.93) ** |                    |                  |                  | 0.18 | 455.77 | 10.03 |
| 10 | -1152.39<br>(0.32) |                    |                   |                      | 52.67<br>(3.83) ** | -27.02<br>(1.04) | 55.05<br>(0.36)  | 0.14 | 465.48 | 7.91  |
| 11 | -219.09<br>(0.31)  | 88.02<br>(2.34) *  | 9.03<br>(1.34)    | -383.43<br>(2.20) *  | 0.28<br>(0.01)     |                  |                  | 0.17 | 457.62 | 7.46  |
| 12 | -1128.08<br>(0.31) |                    |                   | -98.28<br>(0.96)     | 49.96<br>(3.56) ** | -22.46<br>(0.85) | 67.64<br>(0.44)  | 0.14 | 465.62 | 6.16  |
| 13 | -746.77<br>(0.53)  | 79.51<br>(1.87)    | 11.14<br>(1.34)   | -384.35<br>(2.2) *   | 7.76<br>(0.29)     | -9.30<br>(0.43)  |                  | 0.16 | 459.14 | 5.97  |
| 14 | 2365.06<br>(0.51)  |                    | 16.83<br>(1.22)   | -315.14<br>(1.54)    | 49.85<br>(3.56) ** | -14.32<br>(0.53) | 175.83<br>(0.70) | 0.14 | 464.71 | 5.25  |
| 15 | 1415.48<br>(0.31)  | 77.02<br>(1.79)    | 16.48<br>(1.20)   | 446.19<br>(2.07) *   | 9.01<br>(0.34)     | -0.48<br>(0.17)  | 123.27<br>(0.49) | 0.16 | 460.57 | 4.98  |

#### Notes:

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

Table 5 shows that the beta coefficients for inflation rate are positive with market price per share. It indicates that the inflation rate has a positive impact on market price per share. This finding is similar to the findings of Omotor (2010). Similarly, the beta coefficients for money supply are positive with market price per share. It indicates that money supply has a positive impact on market price per share. This finding is consistent with the findings of Sohail and Hussain (2009). Likewise, the beta coefficients for unemployment are negative with market price per share. It indicates that unemployment rate has a negative impact on market price per share. This finding is similar to the findings of Farsio and Fazel (2013). However, the beta coefficients for gross domestic product are positive with market price per share. It indicates that gross domestic product has a positive impact on market price per share. This finding is consistent to the findings of Cole et al. (2008). Similarly, the beta coefficients for exchange rate are negative with market price per share. It indicates that exchange rate has a negative impact on market price per share. This finding is inconsistent with the findings of Buyuksalvarci (2010). However, the beta coefficients for bank rate are positive with market price per share. It indicates that bank rate has a positive impact on market price per share. This finding is inconsistent with the findings of Fama (1981).

## 4. Summary and conclusion

Financial institutions contribute to the national economy by accumulating the capital funds to meet the financial needs of different productive and business sectors. Commercial banks play an important role in the financial service industry and they have become a principal financial intermediary in the fund transfer system. *Banks that have good health will attract many investors.* Stock markets are essential for economic growth as they insure the flow of resources to the most productive investment opportunities. The stock price in the market is not static rather it changes every day. The most obvious factor that influence is demand and supply factors. The price of any commodity is affected by both micro-economic and macro-economic factors.

This study attempts to analyze the effect of macro-economic variables on stock return of Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study showed that gross domestic product, money supply, inflation rate, exchange rate and unemployment rate have positive impact on stock return. However, bank rate has negative impact on stock return. Likewise, gross domestic product, money supply, inflation rate and bank rate have positive impact on market price per share. However, exchange rate and unemployment rate have negative impact on market price per share. Likewise, the study also concluded that inflation rate is the most influencing factor that explains the changes in the stock return of Nepalese commercial banks. Similarly, the study also concluded that gross domestic product is the most influencing factor that explains the changes in the market price per share in context of Nepalese commercial banks.

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## Abstract

*This study examines the impact of political instability, macroeconomic and bank-specific factors on the profitability of Nepalese commercial banks. Return on asset and return on equity are selected as the dependent variables. Similarly, political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 128 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance, the annual report of respective banks and World Bank database. The correlation coefficients and regression models are estimated to test the significance and importance of political instability, macroeconomic and bank-specific factors on the profitability of Nepalese commercial banks.*

*The study showed that political instability has a negative impact on return on assets and return on equity. It means that increase in political instability leads to decrease in return on assets and return on equity. Similarly, there is a positive impact of gross domestic product growth on return on assets. It means that increase in gross domestic product growth rate leads to increase in return on assets. 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, the study showed that bank size has a positive impact on return on assets and return on equity. It means that larger the bank size in terms of assets, higher would be the return on assets and return on equity. In contrast, credit to deposit ratio has a negative impact on return on assets and return on equity. It shows that higher the credit to deposit ratio, lower would be the return on assets and return on equity. Furthermore, capital adequacy ratio has a positive impact on return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets.*

**Key words:** Return on asset, return on equity, political instability, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size.



# 1. Introduction

Banks are the most important financial intermediaries in the most economies that provide a bundle of different services. As financial intermediaries, banks play a crucial role in the operation of most economies. The efficiency of financial intermediation can also affect economic growth. Besides, banks insolvencies can result in systemic crisis. Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou *et al.*, 2005). Therefore, it is important to understand the determinants of banking sector profitability. Due to globalization and financial integration, national and international level focused on financial system stability and sustainability (Javaid, 2016). A reliable and efficient banking system has to achieve three goals: to give a considerable profit, to offer a high-quality service to customers, and to have sufficient funds to lend to borrowers. The growth of any economy largely depends on its banking sector. Hence, the importance of bank profitability in the economy can be determined at the micro and macro levels. At the micro level, profit is a determinant and required for any competitive banking institution. Every bank tries to earn and achieve good profits in order to be in the business especially at the time of growing competition in the financial markets. At the macro level, a profitable banking sector should be able to absorb external negative shocks and to achieve the stability of the financial system (Akhter *et al.*, 2011).

Commercial banks play a vital role in each country's economy, since growth can be achieved if the savings are effectively channeled for investments (Erina and Lace, 2013). Well-functioning commercial banks increase the economic growth of a country and poor performance of commercial banks increase the chances of failure, eventually leading to financial crisis. Chinoda (2014) investigated the determinants of commercial bank profitability in Zimbabwe. The study concluded that bank size, credit to deposit ratio and GDP are positively related to return on assets and return on equity. Similarly, Nuhiu *et al.* (2017) elaborated whether the determinants of commercial banks profitability affect the financial performance of commercial banks in Kosovo. The study found that GDP growth rate 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. Moreover, Yahya *et al.* (2014) investigated the impact of political instability, macroeconomic and bank specific factors on the profitability of Islamic banks in the context of Yemen. The study found that political instability has a negative relationship with return on assets and return on equity. In addition, Liyana and Indrayani (2020) determined 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.

Hassan and Ahmed (2019) examined the impact of bank specific characteristics in determining the Islamic banking profitability in Bangladesh. The study concluded that there is a negative relationship between bank size and return on assets. Moreover, Francis (2013) analyzed the determinants of commercial bank profitability in Sub-Saharan Africa. The study revealed that capital adequacy ratio and bank size positively affect return on asset. The study also found that GDP growth negatively and significantly affects return on asset. Likewise, Irawati and Maksum (2018) assessed the impact of risk management and bank size on the profitability of commercial banking in Indonesia. The study showed that there is a positive and significant effect of capital adequacy ratio on bank's return on asset. Similarly, non-performing loan has a negative but insignificant effect on return on asset. Further, the study implied that it is more profitable to invest in a bigger bank with a high capital adequacy ratio and less non-performing loans.



Hagedoorn and Cloudt (2003) examined the relationship between firm size and profitability for a sample of 1,478 German manufacturing firms in 31 industries. The result of the study revealed that firm size is not the major determinant of profitability. The profitability would depend largely on how well firms cope with size and exploit the opportunities associated with it. Lee and Hsieh (2013) examined the impact of bank capital on profitability and risk in Asian banking. The study concluded that banks in low-income countries have a higher capital effect on profitability. The study also revealed that banks investments have positive effect on profitability. Furthermore, Parvin et al. (2019) analyzed the effect of liquidity and bank size on the profitability of commercial banks in Bangladesh. The study concluded that there is a positive significant impact of liquidity on the profitability of the banks. In addition, Boyd and Runkle (1993) revealed that larger firms will have better risk diversification, more economic scale advantage and overall better cost efficiency. Further, Fanta et al. (2013) revealed that capital adequacy ratio, as a measure of external corporate governance mechanism, has statistically significant positive effect on bank profitability.

Kolapo et al. (2012) investigated the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years (2000-2010). The study revealed that non-performing loan and loan loss provision have a negative and statistically significant relationship with return on assets. Similarly, Ali et al. (2018) determined the impact of macroeconomic variables on Islamic banks' profitability in Brunei. The study showed that GDP, inflation, exchange rate, oil prices and money supply have a significant positive impact on Islamic banks' profitability. Moreover, Brini and Jemmali (2016) determined the impact of the political instability on conventional banks' stability of Tunisian commercial banks. The study found that there is a negative relationship between political instability and bank stability. Elshaday et al. (2018) found that capital adequacy ratio and size of the bank have positive and statistically significant effect on return on equity. Likewise, non-performing loans, loan loss provision, leverage ratio and operational cost efficiency have negative and statistically significant effect on return on equity. Moreover, Setiawan (2015) examined the determinants of ROA (return on assets) of full-fledged Islamic banks in Indonesia. The study revealed that financing to deposit ratio, debt to total asset ratio and capital adequacy ratio have positive and significant relationship with return on assets. However, size, and operational efficiency ratio have a negative and significant relationship with return on assets.

In the context of Nepal, Panta (2018) revealed that non-performing loan and bank size has a negative and significant impact on return on assets and return on equity. Pradhan and Upadhaya (2018) examined the impact of financial structure and macro-economic variables on the profitability of Nepalese commercial banks. The study found that firm size and GDP have a positive impact on profitability of Nepalese commercial banks. Similarly, Shrestha (2018) investigated the relationship between liquidity management and profitability of commercial banks in Nepal. The study concluded that there is a positive and insignificant relationship of reserve ratio and credit to deposit ratio with return on assets. Gyawali (2018) analyzed the non-performing asset and its effects on profitability of Nepalese commercial banks. The study showed that there is a negative impact of non-performing loan on return on assets in context of Nepalese commercial banks. Likewise, Budhathoki and Rai (2020) examined the effect of firm specific factors on the profitability of Nepalese commercial banks during 2002/03-2016/17. The study identified that asset quality, capital adequacy ratio and operating efficiency have a negative and significant impact on return on assets.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of political instability, macroeconomic and bank-specific factors on the profitability of 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 main purpose of the study is to analyze the impact of political instability, macroeconomic and bank-specific factors on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of political instability, gross domestic product growth, and credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size with return on asset 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 16 commercial banks out of 27 commercial banks on the basis of total assets for the period from 2013/14 to 2020/21, leading to a total of 128 observations. The study employed stratified sampling method. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance, the annual report of respective banks and World Bank database. 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 |
|-------------------------------------|-------------------------------------|-------------------|--------------|
| <b>Public Banks</b>                 |                                     |                   |              |
| 1                                   | Nepal Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 2                                   | Rastriya Banijya Bank Limited       | 2013/14 - 2020/21 | 8            |
| <b>Joint Venture Banks</b>          |                                     |                   |              |
| 3                                   | Everest Bank Limited                | 2013/14 - 2020/21 | 8            |
| 4                                   | Himalayan Bank Limited              | 2013/14 - 2020/21 | 8            |
| 5                                   | Nabil Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 6                                   | NMB Bank Limited                    | 2013/14 - 2020/21 | 8            |
| <b>Private Banks</b>                |                                     |                   |              |
| 7                                   | Citizens Bank International Limited | 2013/14 - 2020/21 | 8            |
| 8                                   | Global IME Bank Limited             | 2013/14 - 2020/21 | 8            |
| 9                                   | Kumari Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 10                                  | Mega Bank Nepal Limited             | 2013/14 - 2020/21 | 8            |
| 11                                  | Nepal Investment Bank Limited       | 2013/14 - 2020/21 | 8            |
| 12                                  | NIC Asia Bank Limited               | 2013/14 - 2020/21 | 8            |
| 13                                  | Prabhu Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 14                                  | Prime Commercial Bank Limited       | 2013/14 - 2020/21 | 8            |
| 15                                  | Sanima Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 16                                  | Siddhartha Bank Limited             | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                     |                   | <b>128</b>   |

Thus, the study is based on the 128 observations.

## The model

The model used in this study assumes that the bank's profitability depends upon political instability, macroeconomic and bank-specific factors. The dependent variables selected for the study are return on asset and return on equity. Similarly, the selected independent variables are political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size. Therefore, the model takes the following form:

Profitability = f (political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size)

More specifically,

$$ROA = \beta_0 + \beta_1 PI + \beta_2 GDPG + \beta_3 CD + \beta_4 CAR + \beta_5 NPL + \beta_6 Bsize + e_{it}$$

$$ROE = \beta_0 + \beta_1 PI + \beta_2 GDPG + \beta_3 CD + \beta_4 CAR + \beta_5 NPL + \beta_6 Bsize + e_{it}$$

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.

GDPG = Gross domestic product growth rate, in percentage.

CD = Credit to deposit ratio as measured by the total credit to total deposit, in percentage.

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

PI = Political instability, in index.

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

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

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

## Political instability

Political instability is measured by political instability index which is the average value of other indexes such as Economist Intelligence Unit, the World Economic Forum, and the Political Risk Services (Lakew, 2020). Sanlısoy et al. (2017) investigated the effect of political risk on profitability of Turkish banks. The study revealed a negative relationship between political instability and profitability of banks measured by return on assets. Similarly, Yalcinkaya et al. (2016) found a negative relationship between political instability and profitability. Jaara (2021) examined the impact of political instability on banks performance. The study illustrated that political instability has a negative relationship with return assets and return on equity. Kleinow and Nell (2015) concluded a negative relationship between political instability and return on assets. Likewise, Jadah et al. (2020) showed a negative relationship between political instability and profitability of Iraqi banks measured by return on assets and return on equity. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a negative relationship between political instability and bank profitability.

## Gross domestic product growth

Samad (2015) examined the impact of bank specific characteristics and macroeconomic variables in determining the banks' profitability of Bangladesh. The study found that GDP growth has a positive relationship with bank profitability. Similarly, Kosmidou et al. (2005) concluded a significant positive relationship between bank profitability and GDP growth. Bikker and Vervliet (2018) stated that GDP growth has a positive relationship with return on assets and return on equity. Hassan and Ahmed (2019) revealed that GDP growth has a positive and significant effect on profitability of Islamic banks. Likewise, Jara-Bertin et al. (2014) found a positive relationship between GDP growth and return on assets. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between GDP growth and bank profitability.

## Credit to deposit ratio

Credit to deposit ratio is measured as the ratio of total credit provided by the banks out of the deposit collected. Mehta and Bhavani (2017) examined the factors that influence 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. 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 of Ethiopian private commercial banks. Mohanty and Krishnankutty (2018) showed that return on asset has a negative and significant relationship with credit to deposit ratio. Likewise, Vellanita et al. (2019) revealed a negative relationship between credit to deposit ratio and profitability as measured by return on equity. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a negative relationship between credit to deposit ratio and bank profitability.

## Capital adequacy ratio

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. Likewise, Widyastuti et al. (2017) found that capital adequacy ratio positively influences bank profitability. Alzoubi (2018) concluded a positive relationship between capital adequacy ratio and profitability of banks measured by return on assets. 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. Similarly, Nahar et al. (2020) identified a positive relationship between capital adequacy ratio and profitability. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between capital adequacy ratio and bank profitability.

## Non-performing loan

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, Islam et al. (2017) revealed a significant negative relationship between non-performing loan and profitability of banks in Bangladesh. Ramadhanti et al. (2019) determined the effect of capital adequacy, liquidity, and credit risk on bank profitability. The study found a negative relationship between non-performing loan and bank profitability. Similarly, Nwanna and Oguezue (2017) concluded that non-performing loan is negatively related to profitability of banks. Likewise, Collaku and Aliu (2021) showed a significant negative relationship between non-performing loan and profitability as measured by return on assets. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a negative relationship between non-performing loan and bank profitability.

## Bank size

Alfadli and Rjoub (2020) investigated the impacts of bank-specific, industry-specific and macroeconomic variables on bank performance. The study found that bank size has a positive and significant relationship with return on assets and return on equity. Similarly, Lohano and Kashif (2019) concluded that bank size is positively related to return on assets and 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. Similarly, Bogale (2019) found that bank size is significant and positively related to profitability of Ethiopian private commercial banks. Likewise, Chhaidar et al. (2022) showed that bank size is positively related to European bank's profitability. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between bank size 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 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period of 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are PI (Political instability, in index), GDPG (Gross domestic product growth as measured by the growth rate of total goods and services produced within the country in a year, in percentage), CD (Credit to deposit ratio as measured by the total credit to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage) and Bsize (Bank size as measured by total assets, Rs in billion).

| Variables | Minimum | Maximum | Mean  | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| ROA       | -1.44   | 2.89    | 1.60  | 0.53           |
| ROE       | -0.27   | 54.07   | 16.70 | 6.56           |
| PI        | -1.13   | -0.20   | -0.69 | 0.28           |
| GDPG      | -2.10   | 8.20    | 4.21  | 3.31           |
| CD        | 56.73   | 98.08   | 82.75 | 8.42           |

|              |       |        |       |       |
|--------------|-------|--------|-------|-------|
| <b>CAR</b>   | 4.62  | 17.91  | 12.88 | 1.97  |
| <b>NPL</b>   | 0.02  | 24.29  | 1.78  | 2.37  |
| <b>Bsize</b> | 20.57 | 346.15 | 85.43 | 42.15 |

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 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are PI (Political instability, in index), GDPG (Gross domestic product growth as measured by the growth rate of total goods and services produced within the country in a year, in percentage), CD (Credit to deposit ratio as measured by the total credit to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage) and Bsize (Bank size as measured by total assets, Rs in billion).

| Variables    | ROA      | ROE      | PI      | GDPG   | CD       | CAR      | NPL     | Bsize |
|--------------|----------|----------|---------|--------|----------|----------|---------|-------|
| <b>ROA</b>   | 1        |          |         |        |          |          |         |       |
| <b>ROE</b>   | 0.464**  | 1        |         |        |          |          |         |       |
| <b>PI</b>    | -0.211*  | -0.265** | 1       |        |          |          |         |       |
| <b>GDPG</b>  | 0.192*   | -0.090   | -0.179* | 1      |          |          |         |       |
| <b>CD</b>    | -0.145   | -0.429** | 0.440** | 0.051  | 1        |          |         |       |
| <b>CAR</b>   | 0.064    | -0.396** | 0.440** | -0.030 | 0.565**  | 1        |         |       |
| <b>NPL</b>   | -0.475** | -0.182*  | -0.198* | 0.006  | -0.382** | -0.361** | 1       |       |
| <b>Bsize</b> | 0.036    | 0.058    | 0.731** | -0.166 | 0.119    | 0.218*   | -0.220* | 1     |

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

Table 3 shows that political instability has a negative relationship with return on assets. It means that increase in political instability leads to decrease in return on assets. However, there is a positive relationship between gross domestic product growth and return on assets. It means that increase in gross domestic product growth rate leads to increase in return on assets. In contrast, credit to deposit ratio has a negative relationship with return on assets. It shows that higher the credit to deposit ratio, lower would be the return on assets. Furthermore, 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 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. Further, this study shows that there is a positive relationship between bank size and return on assets. It means that larger the bank size in terms of assets, higher would be the return on assets.

Similarly, the result also shows that political instability has a negative relationship with return on equity. It means that increase in political instability leads to decrease in return on equity. However, there is a negative relationship between gross domestic product growth and return on equity. It means that increase in gross

domestic product growth rate leads to decrease in return on equity. In contrast, credit to deposit ratio has a negative relationship with return on equity. It shows that higher the credit to deposit ratio, lower would be the return on equity. Furthermore, 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. 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. Further, this study shows that there is a positive relationship between bank size and return on equity. It means that larger the bank size in terms of assets, higher would be the return on equity.

## Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size with return on asset of Nepalese commercial banks.

**Table 4:** Estimated regression results of political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size on return on assets

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is  $ROA = \beta_0 + \beta_1 PI_i + \beta_2 GDPG_i + \beta_3 CD_i + \beta_4 CAR_i + \beta_5 NPL_i + \beta_6 Bsize_i + \epsilon_{it}$  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 PI (Political instability, in index), GDPG (Gross domestic product growth as measured by the growth rate of total goods and services produced within the country in a year, in percentage), CD (Credit to deposit ratio as measured by the total credit to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage) and Bsize (Bank size as measured by total assets, Rs in billion).

| Models | Intercepts          | Regression coefficients of |                   |                    |                    |                     |                  | Adj. R_bar² | SEE   | F-value |
|--------|---------------------|----------------------------|-------------------|--------------------|--------------------|---------------------|------------------|-------------|-------|---------|
|        |                     | PI                         | GDPG              | CD                 | CAR                | NPL                 | Bsize            |             |       |         |
| 1      | 1.324<br>(10.851)** | -0.397<br>(2.427)*         |                   |                    |                    |                     |                  | 0.037       | 0.522 | 5.890   |
| 2      | 1.467<br>(19.496)** |                            | 0.031<br>(2.198)* |                    |                    |                     |                  | 0.029       | 0.525 | 4.830   |
| 3      | 2.357<br>(5.084)**  |                            |                   | -0.009<br>(1.646)  |                    |                     |                  | 0.013       | 0.529 | 2.710   |
| 4      | 1.376<br>(4.403)**  |                            |                   |                    | 0.017<br>(0.718)   |                     |                  | 0.004       | 0.533 | 0.515   |
| 5      | 1.788<br>(34.314)** |                            |                   |                    |                    | -0.106<br>(6.053)** |                  | 0.219       | 0.471 | 36.637  |
| 6      | 1.455<br>(4.039)**  |                            |                   |                    |                    |                     | 0.031<br>(0.401) | 0.007       | 0.534 | 0.161   |
| 7      | 1.253<br>(9.861)**  | -0.343<br>(2.083)*         | 0.026<br>(1.816)  |                    |                    |                     |                  | 0.054       | 0.518 | 4.649   |
| 8      | 1.782<br>(3.113)**  | -0.263<br>(1.418)          | 0.028<br>(1.935)  | -0.006<br>(0.949)  |                    |                     |                  | 0.054       | 0.518 | 3.397   |
| 9      | 1.391<br>(2.410)*   | -0.389<br>(2.085)*         | 0.028<br>(2.022)* | -0.014<br>(2.110)* | 0.077<br>(2.720)** |                     |                  | 0.100       | 0.505 | 4.528   |

|    |                    |                     |                    |                     |                   |                     |                   |       |       |        |
|----|--------------------|---------------------|--------------------|---------------------|-------------------|---------------------|-------------------|-------|-------|--------|
| 10 | 2.948<br>(5.822)** | -0.369<br>(2.434)*  | 0.030<br>(2.630)** | -0.024<br>(4.359)** | 0.042<br>(1.778)* | -0.136<br>(8.052)** |                   | 0.407 | 0.409 | 18.469 |
| 11 | 1.364<br>(1.515)   | -0.734<br>(3.216)** | 0.030<br>(2.667)** | -0.021<br>(3.436)** | 0.045<br>(1.947)  | -0.127<br>(7.337)** | 0.197<br>(2.117)* | 0.424 | 0.404 | 16.577 |

**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 political instability are negative with return on assets. It indicates that political instability has a negative impact on return on assets. This finding is similar to the findings of Jaara (2021). The beta coefficients for gross domestic product growth are positive with return on assets. It indicates that gross domestic product growth has a positive impact on return on assets. This finding is consistent with the findings of Jara-Bertin et al. (2014). 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 similar to the findings of Mehta and Bhavani (2017). 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 consistent with the findings of Farkasdi et al. (2021). Moreover, the beta coefficients for non-performing loans 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 Collaku and Aliu (2021).

Table 5 shows the estimated regression results of political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size on return on equity of Nepalese commercial banks.



**Table 5:** Estimated regression results of political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio, non-performing loan and bank size on return on equity

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is  $ROE = \beta_0 + \beta_1 PI_{it} + \beta_2 GDPG_{it} + \beta_3 CD_{it} + \beta_4 CAR_{it} + \beta_5 NPL_{it} + \beta_6 Bsize_{it} + \epsilon_{it}$  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 PI (Political instability, in index), GDPG (Gross domestic product growth as measured by the growth rate of total goods and services produced within the country in a year, in percentage), CD (Credit to deposit ratio as measured by the total credit to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage) and Bsize (Bank size as measured by total assets, Rs in billion).

| Models | Intercepts           | Regression coefficients of |                   |                     |                     |                     |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|--------|----------------------|----------------------------|-------------------|---------------------|---------------------|---------------------|-------------------|-------------------------|-------|---------|
|        |                      | PI                         | GDPG              | CD                  | CAR                 | NPL                 | Bsize             |                         |       |         |
| 1      | 12.469<br>(8.408)**  | -6.129<br>(3.081)**        |                   |                     |                     |                     |                   | 0.063                   | 6.351 | 9.495   |
| 2      | 17.448<br>(18.539)** |                            | -0.178<br>(1.012) |                     |                     |                     |                   | 0.001                   | 6.561 | 1.025   |
| 3      | 44.388<br>(8.513)**  |                            |                   | -0.335<br>(5.337)** |                     |                     |                   | 0.178                   | 5.948 | 28.489  |
| 4      | 33.630<br>(9.491)**  |                            |                   |                     | -1.315<br>(4.834)** |                     |                   | 0.150                   | 6.049 | 23.366  |
| 5      | 17.593<br>(24.532)** |                            |                   |                     |                     | -0.520<br>(2.072)*  |                   | 0.025                   | 6.477 | 4.292   |
| 6      | 13.845<br>(3.124)**  |                            |                   |                     |                     |                     | 0.612<br>(0.649)  | 0.005                   | 6.575 | 0.422   |
| 7      | 13.247<br>(8.557)**  | -6.719<br>(3.345)**        | -0.281<br>(1.636) |                     |                     |                     |                   | 0.075                   | 6.309 | 6.148   |
| 8      | 39.671<br>(6.041)**  | -2.706<br>(1.273)          | -0.182<br>(1.113) | -0.291<br>(4.127)** |                     |                     |                   | 0.180                   | 5.490 | 10.302  |
| 9      | 43.276<br>(6.474)**  | -1.546<br>(0.715)          | -0.187<br>(1.159) | -0.214<br>(2.736)** | -0.712<br>(2.155)*  |                     |                   | 0.204                   | 5.854 | 9.115   |
| 10     | 57.763<br>(9.023)**  | -1.355<br>(0.707)          | -0.173<br>(1.208) | -0.309<br>(4.355)** | -1.043<br>(3.506)** | -1.265<br>(5.921)** |                   | 0.376                   | 5.181 | 16.323  |
| 11     | 35.502<br>(3.135)**  | -6.49<br>(2.250)*          | -0.173<br>(1.230) | -0.250<br>(3.366)** | -0.994<br>(3.397)** | -1.132<br>(5.212)** | 2.773<br>(2.363)* | 0.399                   | 5.086 | 15.044  |

**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 political instability are negative with return on equity. It indicates that political instability has a negative impact on return on equity. This finding is similar to the findings of Jadah et al. (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 Vellanita et al. (2019). Likewise, 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 Farkasdi et al. (2021). Moreover, the beta coefficients for non-performing loans 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 Kadioglu and Ocal (2017). Moreover, 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 Kassem and Sakr (2018).

## 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 profitability and ultimately the stability of banking system. Commercial banks must analyze the factors that may be associated with their profitability 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 political instability, macroeconomic and bank specific factors on the profitability of Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study shows that political instability, credit to deposit ratio and non-performing loan have a negative impact on return on asset. However, gross domestic product growth, capital adequacy ratio and bank size have a positive impact on return on asset. Likewise, political instability, gross domestic product growth, credit to deposit ratio, capital adequacy ratio and non-performing loan have a negative impact on return on equity. However, bank size has a positive impact on return on equity. Likewise, the study also concluded that non-performing loan followed by political instability is the most influencing factor that explains the changes in the return on asset of Nepalese commercial banks. Similarly, the study also concluded that credit to deposit ratio followed by capital adequacy ratio is the most influencing factor that explains the changes in return on equity in context of Nepalese commercial banks.

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PART 2

# Capital Market





## Abstract

*The study examines the effect of liquidity, leverage and profitability on firm value of Nepalese insurance companies. Market capitalization and book value per share are selected as the dependent variables. The selected independent variables are current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity. The study is based on secondary data of 12 insurance companies with 110 observations for the period from 2011/12 to 2020/21. The data were collected from publications and websites of Rastriya Bema Samiti, Ministry of Finance, and annual reports of the selected insurance companies. The correlation coefficients and regression models are estimated to test the significance and importance of liquidity, leverage, and profitability on the firm value of Nepalese insurance companies.*

*The results showed that current ratio has a negative impact on book value per share and market capitalization. It reveals that increase in current ratio leads to decrease in book value per share and market capitalization. Likewise, the results also showed that loan to deposit ratio has a negative impact on book value per share and market capitalization. It indicates that higher the loan to deposit ratio, lower would be the book value per share and market capitalization. In addition, the study showed that return on assets has a positive impact on book value per share and market capitalization. It indicates that higher the return on assets, higher would be the book value per share and market capitalization. In addition, return on equity has a positive impact on market capitalization. It reveals that increase in return on equity leads to increase in market capitalization in the context of Nepalese insurance companies.*

**Key words:** Market capitalization, book value per share, current ratio, loan to deposit ratio, short-term debt to assets ratio, return on assets and return on equity.

# 1. Introduction

The value of the company is very important to be considered by banking management because it can affect investors' perceptions of the company. Company value not only reflects how intrinsic value is at the moment but also reflects prospects and expectations of the company's ability to increase the value of its wealth in the future. Globalization has created a business environment that causes the need for a review of the management system used by companies to be able to survive and prosper. Therefore, companies are required to always be able to increase the value of their companies (Sugianto et al., 2020). The increase in stock prices shows investor confidence in the company. Investors are willing to pay more to get a higher profit. High stock prices can provide a good signal to attract investors' interest in making investment decisions (Bustani et al., 2021). Financial performance reflects the company's ability to manage and allocate its resources. Financial performance of firm has a statistically significant impact on firm value. The good financial performance of the company is the primary consideration by investors in making investment decisions. Improved financial performance is expected to increase the firm value, so that the higher the financial performance, the higher would be the firm value (Djazuli, 2017). Firms always have a target to increase their value, because the value of the firm is an attractive factor for investors. Management of the company believes and is confident that consistent profits attract and retain investors to invest in the company, which in turn will increase firm value (Fajaria and Isnalita, 2018).

A competitive advantage is an attribute that enables a company to outperform its competitors. This allows a company to achieve superior margins compared to its competition and generates value for the company and its shareholders. A competitive advantage distinguishes a company from its competitors. It contributes to higher prices, more customers, and brand loyalty. Establishing such an advantage is one of the most important goals of any company. In today's world, it is essential to business success. Without it, companies will find it difficult to survive. Competitive advantage is maintained to achieve the company's goals, namely the welfare of shareholders, which can be achieved by optimizing company value (Jihadi et al., 2021). Increasing company value is important for shareholders in maximizing the wealth they have (Kim et al., 1993). The value of a company is basically measured by several aspects, namely the market price of a company's shares, because this reflects the investor's assessment of the total equity owned. The reason is because the value of the company can increase welfare for shareholders if the share price increases (Endri and Fathony, 2020). The higher the stock price increases, the more the shareholders' profits increase so this situation will be attractive to investors because motivating demand for shares causes the value of the company to increase (Endri et al., 2019). Considering that the main activities of banks act as intermediaries, i.e., collecting and distributing third party funds, operational costs and bank revenues are dominated by interest costs and interest yields. Any increase in operating costs will result in a reduction in profit before tax which will ultimately reduce the profit or profitability (ROA) of the bank concerned (Nuriyah et al., 2018).

The value of the company is very important because they reflect the performance of the company that could affect investor perception of the company. The value of the company can be reflected in the price of shares owned by the company. According to Hermuningsih (2016), the primary goal of companies that have gone public is to increase the company's value. Therefore, the company's value will be significant because it will reflect the company's performance which can affect the perceptions and perspectives of investors towards the target company to be addressed. According to Mumtaz et al. (2013), financial performance affects firm value and capital structure of a particular firm. When the company's financial performance improves, the company's value also increases. Paramitha (2020) investigated the role of profitability in mediating the effect of capital structure and liquidity on firm value. The study showed

that the liquidity has a negative and insignificant effect on firm value. The study also showed that the profitability has a positive and partially significant effect on firm value. Nurwulandari (2021) analyzed the effect of liquidity, profitability and firm size on firm value with capital structure as intervening variable. The study showed that liquidity, profitability and firm size have a positive and insignificant effect on firm value. The study also showed that capital structure has a negative and significant effect on firm value. In addition, Satria and Husna (2019) revealed that return on asset affects firm value, while debt to asset ratio and current ratio does not affect firm value. Furthermore, Ishari and Abeyrathna (2016) assessed the value of the firm by using profitability and growth ratios (profitability, gearing, investment, solvency, financial efficiency ratios). The study showed a negative and insignificant relationship between financial leverage and firm value.

The high or low value of the company can be seen from the ability to pay dividends. This is because the company's ability to obtain profits is closely related to the company's ability to pay dividends, where an increase in company value is influenced by large dividends (Zulkifli et al., 2017). Dividend distribution will make shareholders have additional returns other than capital gains. For this reason, the company is expected to be able to set the proportion of profits received to be paid to investors according to the number of shares held. Although the company can provide guarantees regarding the value of the company to the investor through the amounts of dividends paid, the company also needs to consider some of the funds needed for the development of the company. Nwamaka and Ezeabasili (2017) found that the value of the company was strongly influenced by dividend policy, especially for public companies. In addition to dividend policy, another factor that influences company value is profitability (Daeli and Endri, 2018). High profitability shows good corporate prospects so investors will respond positively to these signals and are expected to increase the value of the company. Conversely, low profitability makes information that the company is in a bad condition, so investors will give a negative response to the company's shares. The higher the ratio of net income to total assets, the better the share's appreciation (Rudangga and Sudiarta, 2016). Cheryta and Moeljadi (2017) found that profitability has a positive influence on firm value. Similarly, Rosikah et al. (2018) explained that changes in company value are not only influenced by ROA, but also influenced by other factors such as ownership and dividend policy. Another factor that can affect company value is the size of the company (firm size), where larger companies will be relatively stable and able to generate profits. Sunarto and Budi (2009) showed that there is a positive relationship between firm size on firm value, meaning that increasing company size will make it easier for companies to obtain funding which can then be used by management for the purpose of increasing company value. In contrast, Nurmindia et al. (2017) found that size of the company proxied by natural log of total assets has no significant influence on firm value. Kodongo et al. (2015) showed that company size is an important factor that drives the value of the company proxied with Tobin's Q.

In the context of Nepal, Bhattarai (2020) found that financial decision, investment decision and profitability have positive and significant effects on firm value. Pradhan and Shrestha (2017) confirmed that there is a positive and significant relationship of the financial leverage and profitability with market value. In addition, Pandey et al. (2020) assessed the effect of asset and liability management on the financial performance of Nepalese commercial banks. The study shows that deposit, other assets and loans and advance have a positive impact on return on assets whereas fixed assets and other liabilities have negative impact on return on assets. Joshi (2012) examined the impact of dividends on stock price in the context of Nepal. The result showed that dividend has a significant effect on market share price in both banking and non-banking sectors. Jaishi (2020) examined the relationship between capital structure and the financial performance of Nepalese insurance companies. The result showed that insurance companies having a high debt ratio

have better financial performance. The study also concluded that an increase in debt ratio and tangibility increases return on assets and an increase in equity, size and liquidity decrease return on assets of the firms.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of liquidity, leverage and profitability on firm value. 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 liquidity, leverage and profitability on firm value of Nepalese insurance companies. Specifically, it examines the relationship of current ratio, loan to deposit ratio, short term debt to asset ratio, assets to equity ratio, return on assets and return on equity with market capitalization and book value per share 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 and discusses the implications of the study findings.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 12 Nepalese insurance companies from 2011/12 to 2020/21, leading to a total of 110 observations. The data were collected from publications and websites of Rastriya Bema Samiti, Ministry of Finance (MoF), 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 numbers of observations.

**Table 1:** List of sample insurance companies selected for the study along with the study period and number of observations

| S.N.                                | Name of the insurance companies           | Study period    | Observations |
|-------------------------------------|-------------------------------------------|-----------------|--------------|
| 1                                   | Premier Insurance Company (Nepal) Limited | 2011/12-2020/21 | 10           |
| 2                                   | Siddhartha General Insurance Limited      | 2011/12-2019/20 | 9            |
| 3                                   | Neco Insurance Limited                    | 2011/12-2020/21 | 10           |
| 4                                   | Lumbini General Insurance Limited         | 2011/12-2019/20 | 9            |
| 5                                   | NLG Insurance Company Limited             | 2011/12-2020/21 | 10           |
| 6                                   | Nepal Insurance Company Limited           | 2011/12-2020/21 | 10           |
| 7                                   | Everest General Insurance Limited         | 2013/14-2020/21 | 8            |
| 8                                   | Sagarmatha General Insurance Limited      | 2011/12-2020/21 | 10           |
| 9                                   | Himalayan General Insurance Limited       | 2014/15-2020/21 | 7            |
| 10                                  | Asian Life Insurance Limited              | 2010/11-2019/20 | 10           |
| 11                                  | Prime Life Insurance Company Limited      | 2012/13-2019/20 | 8            |
| 12                                  | National Life Insurance Company Limited   | 2012/13-2020/21 | 9            |
| <b>Total number of observations</b> |                                           |                 | <b>110</b>   |

Thus, the study is based on the 110 observations.

## The model

The model used in this study assumes that firm value depends on liquidity, leverage and profitability. The dependent variables selected for the study are market capitalization and book value per share. Similarly, the selected independent variables in this study are current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return to equity. The following model equations are designed to test the hypothesis.

$$\begin{aligned} \text{MCAP}_{it} &= \alpha + \beta_1 \text{CR}_{it} + \beta_2 \text{LDR}_{it} + \beta_3 \text{SDAR}_{it} + \beta_4 \text{AER}_{it} + \beta_5 \text{ROA}_{it} + \beta_6 \text{ROE}_{it} + \varepsilon_{it} \\ \text{BVPS}_{it} &= \alpha + \beta_1 \text{CR}_{it} + \beta_2 \text{LDR}_{it} + \beta_3 \text{SDAR}_{it} + \beta_4 \text{AER}_{it} + \beta_5 \text{ROA}_{it} + \beta_6 \text{ROE}_{it} + \varepsilon_{it} \end{aligned}$$

Where,

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

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

CR = Current ratio as measured by the ratio of current assets to current liabilities, in percent.

LDR = Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percent.

SDAR = Short-term debt to assets ratio as measured by the ratio of short-term debt and to total assets, in percent.

AER = Assets to equity ratio as measured by the ratio of total assets to total shareholder equity, in percent.

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

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

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

## Current ratio

Husna and Satria (2019) determined the effect of return on assets, debt to asset ratio (DAR), current ratio (CR), firm size, and dividend payout ratio (DPR) to the firm value of manufacturing companies listed in Indonesia Stock Exchange for the period 2013-2016. The study found that the return on asset and firm size have effects on firm value. However, current ratio and leverage ratio have negative effects on firm value. Similarly, Gamayuni (2015) examined the relationship between intangible assets, financial policies, and financial performance to the firm value at going-public company in Indonesia. The results showed that intangible assets, financial policies and financial performance have significant influence on the firm value simultaneously. The study also showed that excess liquid assets have negative effect on firm value. In addition, Sari and Sedana (2020) assessed the effect of profitability and liquidity on firm value and determined the role of capital structure in mediating the effect of profitability and liquidity on firm value in the construction and building subsector companies listed on the Indonesia Stock Exchange (IDX) for the period 2013-2017. The results showed that capital structure has a positive and significant effect on firm value. Similarly, profitability has a positive and significant effect on firm value and liquidity has a negative and not significant effect on firm value and capital structure. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a negative relationship between current ratio and firm value.

## Loan to deposit ratio

Cheng and Tzeng (2011) examined the effect of leverage on firm values using 645 companies listed in Taiwan Securities Exchange (TSE) from 2000-2009. The study found a negative effect of leverage and credit to deposit ratio on firm values. In addition, Morck et al. (2000) analyzed the relationship between banks, ownership structure, and firm value in Japan. The study found a negative relationship between loan to deposit ratio and firm value. Similarly, Carter et al. (2006) revealed that hedging and credit ratio negatively affect firm value in the context of US airline industry. Kodongo et al. (2015) investigated the relationship between leverage and the financial performance of listed firms in Kenya. The study found strong evidence that leverage significantly, and negatively, affects firm profitability but does not affect firm value. The results also suggested that asset tangibility, sales growth and firm size are important determinants of profitability. Furthermore, the study showed a negative relationship between loan to deposit ratio and firm value. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a negative relationship between loan to deposit ratio and firm value.

## Short-term debt to assets ratio

Abor (2007) investigated the debt policy and performance of SMEs of Ghanaian and South African firms. The study found that short-term debt to assets ratio has negative and statistically significant impact on firm value. In addition, Lixin and Lin (2011) investigated the relationship between debt financing and market value of company. The study showed that there is a negative and insignificant relationship between the short-term debt financing and market value. Furthermore, Ahmad et al. (2012) investigated the impact of capital structure on firm performance of Malaysian firms. The study revealed that the short-term debt to assets ratio has a negative impact on firm value. In addition, Ha and Tai (2017) assessed the impact of capital structure and cash holdings on firm value in companies listed on the Ha Chi minh stock exchange. The study concluded that the impact of short-term debt on firm value is negative and insignificant. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a negative relationship between short-term debt to assets ratio and firm value.

## Assets to equity ratio

Uzliawati et al. (2018) examined the optimization of capital structure and firm value. The study showed that the asset to equity ratio has a positive and significant impact on firm value. Hendrani and Septyanto (2021) investigated the effect of return on asset, debt to equity ratio and company size on company value in manufacturing companies. The study concluded that the assets to equity ratio has a positive effect on firm value manufacturing companies listed on the Indonesia stock exchange. Likewise, Azaro et al. (2021) found that there is a positive and insignificant relationship between assets to equity ratio and firm value. Ismiyatun et al. (2021) assessed the determinants of firm value of insurance companies in Indonesia. The study showed that the assets to equity ratio and current ratio have a positive and significant influence on the firm value. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between assets to equity ratio and firm value.

## Return on assets

Satria and Husna (2019) examined the effects of return on asset, debt to asset ratio, current ratio, firm size, and dividend pay-out ratio on firm value. The study showed that there is a positive and significant effect of return to assets on firm value. Wahyuni (2022) examined the effect of return on assets and return on equity on firm value with dividends as an intervening variable. The study showed that there is a positive and significant effect of both ROE and ROA on firm value. Moreover, Rohmawati and Shenurti (2019) examined the influence of financial performance and corporate social responsibility on firm's value. The study showed that there is a positive relationship between the return on assets and firm value. Renalita and Tanjung (2013) investigated the effect of return on assets, free cash flow, and debt to equity ratio on company value. The study showed that the return on assets has a significant positive effect on firm value. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between return on assets and firm value.

## Return on equity

Sutomo and Budiharjo (2019) assessed the effect of dividend policy and return on equity on firm value. The study showed that there is a negative and significant relationship between the return on equity and firm value. Likewise, Fumani (2015) examined the effect of capital structure on firm value, the rate of return on equity and earnings per share of listed companies in Tehran stock exchange. The study showed that there is a significant negative relationship between return on equity and firm value. Similarly, Bauer et al. (2004) revealed that there is a negative association between return on equity and firm value in the context of European firms. Furthermore, Mak and Kusnadi (2005) showed a negative relationship of return on equity with the firm value. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a negative relationship between return on equity and firm value.

# 3. Results and discussion

## Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2011/12 to 2020/21.



**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese insurance companies for the study period of 2011/12 to 2020/21. The dependent variables are MCAP (Market capitalization as measured by the product of number of outstanding shares and current market price, Rs in billion) and BVPS (Book value per share as measured by the product of total equity to number of outstanding shares, in Rs). The independent variables are CR (Current ratio as measured by the ratio of current assets to current liabilities, in percent), LDR (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percent), SDAR (Short-term debt to assets ratio as measured by the ratio of short-term debt and to total assets, in percent), AER (Assets to equity ratio as measured by the ratio of total assets to total shareholder equity, in percent), ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percent), and ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percent).

| Variables | Minimum | Maximum | Mean  | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| MCAP      | 0       | 3958.02 | 93.34 | 411.33         |
| BVPS      | 0.35    | 1863.43 | 89.01 | 184.16         |
| CR        | 0       | 6.44    | 0.48  | 1.15           |
| LDR       | 0       | 538.79  | 6.15  | 51.31          |
| SDAR      | 0.03    | 6.37    | 0.66  | 0.61           |
| AER       | 0.63    | 46.95   | 4.52  | 5.78           |
| ROA       | -11.93  | 100.00  | 10.81 | 16.49          |
| ROE       | -71.15  | 305.38  | 32.11 | 48.04          |

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 correlation coefficients matrix

This table shows the descriptive statistics of dependent and independent variables of 12 Nepalese insurance companies for the study period from 2011/12 to 2020/21. The dependent variables are MCAP (Market capitalization as measured by the product of number of outstanding shares and current market price, Rs in billion) and BVPS (Book value per share as measured by the product of total equity to number of outstanding shares, in Rs). The independent variables are CR (Current ratio as measured by the ratio of current assets to current liabilities, in percent), LDR (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percent), SDAR (Short-term debt to assets ratio as measured by the ratio of short-term debt and to total assets, in percent), AER (Assets to equity ratio as measured by the ratio of total assets to total shareholder equity, in percent), ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percent), and ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percent).

| Variables | BVPS  | MCAP   | SDAR   | CR    | LDR   | ROA    | ROE    | AER |
|-----------|-------|--------|--------|-------|-------|--------|--------|-----|
| BVPS      | 1     |        |        |       |       |        |        |     |
| MCAP      | -0.09 | 1      |        |       |       |        |        |     |
| SDAR      | -0.06 | 0.05   | 1      |       |       |        |        |     |
| CR        | -0.03 | -0.03  | -0.03  | 1     |       |        |        |     |
| LDR       | -0.04 | -0.02  | 0.04   | -0.02 | 1     |        |        |     |
| ROA       | 0.23* | 0.08   | 0.45** | -0.06 | -0.08 | 1      |        |     |
| ROE       | -0.09 | 0.60** | 0.15   | -0.06 | -0.08 | 0.46** | 1      |     |
| AER       | -0.17 | 0.11   | -0.09  | -0.11 | 0.01  | -0.17  | 0.25** | 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 short-term debt to assets ratio and book value per share in the context of Nepalese insurance companies. It indicates that increase in short-term debt to assets ratio leads to decrease in book value per share. Similarly, current ratio has a negative relationship with book value per share. It reveals that lower the current ratio, higher would be the book value per share. Likewise, the results also shows that loan to deposit ratio is negatively related to book value per share. It indicates that higher the loan to deposit ratio, lower would be the book value per share. In addition, the study shows that return on assets is positively correlated to book value per share. It indicates that higher the return on assets, higher would be the book value per share. In addition, return on equity is negatively correlated to book value per share. It reveals that increase in return on equity leads to decrease in book value per share. However, the study shows that assets to equity ratio has a negative relationship with book value per share. It reveals that higher the assets to equity ratio, lower would be the book value per share.

On the other hand, short-term debt to assets ratio is positively correlated to market capitalization. It indicates that increase in short-term debt to assets ratio leads to increase in market capitalization. The study also shows that current ratio is negatively correlated to market capitalization. It indicates that increase in current ratio leads to decrease in market capitalization. Likewise, loan to deposit ratio is negatively correlated to market capitalization. It indicates that increase in loan to deposit ratio leads to decrease in market capitalization. In addition, return on assets is positively correlated to market capitalization. It indicates that increase in return on assets leads to increase in market capitalization. In addition, return on equity is positively correlated to market capitalization. It reveals that increase in return on equity leads to increase in market capitalization. However, the study shows that assets to equity ratio have a positive relationship with market capitalization. It reveals that higher the assets to equity ratio, higher would be the market capitalization in the context of Nepalese insurance companies.

## **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 current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity on market capitalization of Nepalese insurance companies.

**Table 4:** Estimated regression results of current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity on market capitalization of Nepalese insurance companies

The results are based on panel data of 12 insurance companies with 110 observations for the period of 2011/12-2020/21 by using the linear regression model and the model is  $MCAP = \beta_0 + \beta_1 CR + \beta_2 LDR + \beta_3 SDAR + \beta_4 AER + \beta_5 ROA + \beta_6 ROE + e$ , where, the dependent variable is MCAP (Market capitalization as measured by the product of number of outstanding shares and current market price, Rs in billion). The independent variables are CR (Current ratio as measured by the ratio of current assets to current liabilities, in percent), LDR (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percent), SDAR (Short-term debt to assets ratio as measured by the ratio of short-term debt and to total assets, in percent), AER (Assets to equity ratio as measured by the ratio of total assets to total shareholder equity, in percent), ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percent), and ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percent).

| Model | Intercept         | Regression coefficients of |                  |                 |                   |                   |                | Adj.R_bar <sup>2</sup> | SEE    | F-value |
|-------|-------------------|----------------------------|------------------|-----------------|-------------------|-------------------|----------------|------------------------|--------|---------|
|       |                   | SDAR                       | CR               | LDR             | ROA               | ROE               | AER            |                        |        |         |
| 1     | 69.10<br>(1.19)   | 35.81<br>(0.55)            |                  |                 |                   |                   |                | 0.01                   | 412.06 | 0.30    |
| 2     | 59.94<br>(1.36)   |                            | -13.11<br>(1.63) |                 |                   |                   |                | 0.02                   | 408.01 | 2.65    |
| 3     | 94.11<br>(2.367)* |                            |                  | -0.03<br>(0.14) |                   |                   |                | 0.01                   | 413.18 | 0.02    |
| 4     | 70.09<br>(1.49)   |                            |                  |                 | 2.15<br>(0.90)    |                   |                | 0.01                   | 411.68 | 0.81    |
| 5     | -72.04<br>(1.90)  |                            |                  |                 |                   | 5.15<br>(7.826)** |                | 0.36                   | 330.09 | 61.25   |
| 6     | 58.04<br>(1.17)   |                            |                  |                 |                   |                   | 7.82<br>(1.15) | 0.01                   | 410.72 | 1.32    |
| 7     | 26.84<br>(0.42)   | 47.52<br>(0.73)            | -13.74<br>(1.69) |                 |                   |                   |                | 0.01                   | 409.14 | 1.58    |
| 8     | 28.41<br>(0.45)   | 44.87<br>(0.68)            | -15.10<br>(1.78) | -0.12<br>(0.58) |                   |                   |                | 0.01                   | 410.41 | 1.16    |
| 9     | 24.26<br>(0.38)   | 21.42<br>(0.29)            | -14.96<br>(1.76) | -0.13<br>(0.62) | 1.88<br>(0.70)    |                   |                | 0.07                   | 411.17 | 0.99    |
| 10    | -88.17<br>(1.72)  | 53.89<br>(0.94)            | -9.55<br>(1.44)  | -0.03<br>(0.15) | -6.78<br>(2.193)* | 6.06<br>(8.359)** |                | 0.40                   | 319.70 | 15.29   |
| 11    | -49.93<br>(0.86)  | 53.33<br>(0.93)            | -8.52<br>(1.28)  | -0.02<br>(0.12) | 7.85<br>(3.225)** | 6.48<br>(8.216)** | 8.32<br>(1.43) | 0.40                   | 318.11 | 13.21   |

**Notes:**

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

Table 4 shows that the beta coefficients for short-term debt to assets ratio are positive with market capitalization. It indicates that the short-term debt to assets ratio has a positive impact on market capitalization. This finding is consistent with the findings of Abor (2007). Likewise, the beta coefficients for current ratio are negative with market capitalization. It indicates that current ratio has a negative impact

on market capitalization. This finding is similar to the findings of Sari and Sedana (2020). Similarly, the beta coefficients for loan to deposit ratio are negative with market capitalization. It indicates that loan to deposit ratio has a negative impact on market capitalization. This finding is consistent with findings of Kodongo et al. (2015). Likewise, the beta coefficients for the return on assets are positive with market capitalization. It indicates that return on assets has a positive impact on market capitalization. This finding is similar to the findings of Rohmawati and Shenurti (2019). Likewise, the beta coefficients for return on equity are positive with market capitalization. It indicates that return on equity has a positive impact on market capitalization. This finding is consistent with the findings of Mak and Kusnadi (2005).

Table 5 shows the regression results of current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity on book value per share of Nepalese insurance companies.

**Table 5:** Estimated regression results of current ratio, loan to deposit ratio, short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity on book value per share of Nepalese insurance companies

The results are based on panel data of 12 insurance companies with 110 observations for the period of 2011/12-2020/21 by using the linear regression model and the model is  $BVPS = \beta_0 + \beta_1 CR + \beta_2 LDR + \beta_3 SDAR + \beta_4 AER + \beta_5 ROA + \beta_6 ROE + e$ , where, the dependent variable is BVPS (Book value per share as measured by the product of total equity to number of outstanding shares, in Rs). The independent variables are CR (Current ratio as measured by the ratio of current assets to current liabilities, in percent), LDR (Loan to deposit ratio as measured by the ratio of total loan to total deposit, in percent), SDAR (Short-term debt to assets ratio as measured by the ratio of short-term debt and to total assets, in percent), AER (Assets to equity ratio as measured by the ratio of total assets to total shareholder equity, in percent), ROA (Return on assets as measured by the ratio of net profit after tax to total assets, in percent), and ROE (Return on equity as measured by the ratio of net profit after tax to total equity, in percent).

| Model | Intercept           | Regression coefficients of |                 |                 |                   |                    |                 | Adj. R <sub>bar</sub> <sup>2</sup> | SEE    | F-value |
|-------|---------------------|----------------------------|-----------------|-----------------|-------------------|--------------------|-----------------|------------------------------------|--------|---------|
|       |                     | SDAR                       | CR              | LDR             | ROA               | ROE                | AER             |                                    |        |         |
| 1     | 100.50<br>(3.836)** | -17.34<br>(0.59)           |                 |                 |                   |                    |                 | 0.09                               | 180.57 | 0.54    |
| 2     | 91.37<br>(4.771)**  |                            | -4.85<br>(0.32) |                 |                   |                    |                 | 0.01                               | 184.03 | 0.10    |
| 3     | 89.78<br>(5.053)**  |                            |                 | -0.13<br>(0.36) |                   |                    |                 | 0.01                               | 184.03 | 0.13    |
| 4     | 61.54<br>(2.996)**  |                            |                 |                 | 2.54<br>(2.430)*  |                    |                 | 0.04                               | 180.15 | 5.91    |
| 5     | 100.16<br>(4.733)** |                            |                 |                 |                   | -0.35<br>(0.95)    |                 | 0.01                               | 184.26 | 0.89    |
| 6     | 113.93<br>(5.160)** |                            |                 |                 |                   |                    | -5.52<br>(1.83) | 0.02                               | 182.21 | 3.34    |
| 7     | 103.52<br>(3.751)** | -17.60<br>(0.60)           | -5.09<br>(0.33) |                 |                   |                    |                 | 0.01                               | 185.48 | 0.23    |
| 8     | 103.70<br>(3.749)** | -17.23<br>(0.58)           | -5.20<br>(0.34) | -0.12<br>(0.35) |                   |                    |                 | 0.02                               | 186.03 | 0.19    |
| 9     | 92.51<br>(3.435)**  | -60.88<br>(1.90)           | -2.59<br>(0.17) | -0.01<br>(0.04) | 3.53<br>(3.003)** |                    |                 | 0.05                               | 179.58 | 2.41    |
| 10    | 113.91<br>(4.134)** | -65.79<br>(2.107)*         | -4.20<br>(0.29) | -0.05<br>(0.16) | 4.94<br>(3.883)** | -1.01<br>(3.053)** |                 | 0.10                               | 175.03 | 3.33    |
| 11    | 123.47<br>(3.949)** | -65.63<br>(2.096)*         | -5.23<br>(0.36) | -0.05<br>(0.15) | 4.67<br>(3.477)** | -0.90<br>(2.123)*  | -2.06<br>(0.14) | 0.09                               | 175.03 | 2.83    |

#### 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. Book value per share is the dependent variable.

Table 5 shows that the beta coefficients for short-term debt to assets ratio are negative with book value per share. It indicates that the short-term debt to assets ratio has a negative impact on book value per share. This finding is consistent with the findings of Ha and Tai (2017). Likewise, the beta coefficients for current ratio are negative with book value per share. It indicates that current ratio has a negative impact on book value per share. This finding is similar to the findings of Gamayuni (2015). Similarly, the beta coefficients for loan to deposit ratio are negative with book value per share. It indicates that loan to deposit ratio has a negative impact on book value per share. This finding is consistent with findings of Morek et al. (2000). Likewise, the beta coefficients for the return on assets are positive with book value per share. It indicates that return on assets has a positive impact on book value per share. This finding is similar to the findings of Renalita and Tanjung (2013). Likewise, the beta coefficients for return on equity are negative with book value per share. It indicates that return on equity has a negative impact on book value per share. This finding is consistent with the findings of Fumani (2015).

## 4. Summary and conclusion

Value of the company is very important and needs to be improved for the benefit of shareholders and stakeholders, in order to increase shareholder wealth, and the interests of other stakeholders. It is therefore necessary to understand what factors that influence the value of the company in order to enhance corporate value. Firm value is reflected in the company's market price, and is a price to pay when the company experienced take over.

This study attempts to analyze the effect of liquidity, leverage and profitability on firm value of Nepalese insurance companies. The study is based on secondary data of 12 insurance companies with 110 observations for the study period from 2011/12 to 2020/21.

The study showed that short-term debt to assets ratio, assets to equity ratio, return on assets and return on equity have positive impact on market capitalization. However, current ratio and loan to deposit ratio have negative impact on market capitalization. Similarly, the study showed that short-term debt to assets ratio, assets to equity ratio, current ratio, loan to deposit ratio return on equity have negative impact on book value per share. Likewise, the study concluded that return on assets is the most influencing factor that explains the changes in the book value per share of Nepalese insurance companies. Similarly, the study also concluded that return on equity is the most influencing factor that explain the changes in the market capitalization in context of Nepalese insurance companies.

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## Abstract

*This study attempts to examine the interrelationship between capital structure and corporate pay-out policy of Nepalese commercial banks. Dividend pay-out ratio and dividend per share are selected as the dependent variables. Similarly, debt to equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 128 observations for the study period from 2013/14 to 2020/21. The data are collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of capital structure on the corporate pay-out policy in the context of Nepalese commercial banks.*

*The study showed that debt-to-equity ratio has negative impact on dividend pay-out ratio and dividend per share. It indicates that higher the debt-to-equity ratio, lower would be the dividend pay-out ratio and dividend per share. Similarly, debt to total assets ratio has a positive impact on dividend pay-out ratio and dividend per share. It indicates that higher the debt to total assets ratio, higher would be the dividend pay-out ratio and dividend per share. Likewise, credit to deposit ratio has a positive impact on dividend pay-out ratio. It indicates that increase in credit to deposit ratio leads to increase in dividend pay-out ratio. Moreover, retained earnings has a positive impact on dividend pay-out ratio and dividend per share. It indicates that higher the retained earnings, higher would be the dividend pay-out ratio and dividend per share. Furthermore, capital adequacy ratio has a positive impact on dividend pay-out ratio and dividend per share. It indicates that higher the capital adequacy ratio, higher would be the dividend pay-out ratio and dividend per share. Likewise, firm size has a positive impact on dividend pay-out ratio. It indicates that larger the firm size, higher would be the dividend pay-out ratio.*

**Key words:** Debt to equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, firm size, dividend pay-out ratio and dividend per share.

# 1. Introduction

The capital structure of the company is the blend of current and long-term debt, owner equity and other sources of endowments to funds its long-term assets. Aligning the capital structure and dividend policy with the company's strategy is crucial task and need critical analysis. According to Shah and Khan (2010), decision of capital structure is core of many other decision in corporate finance. According to Jensen et al. (1992), capital structure refers to the relationship among various long-term forms of financing which includes mainly three types securities i.e., equity shares, preference shares and debenture. Furthermore, Faulkender and Wang (2006) stated that decision regarding financial policy is based conjointly upon capital structure designing and setting dividend policy. If firm uses high leverage and low equity, most of the control is in the hand of investors. On the other hand, if firm uses low leverage and high equity, less dividend should be paid and more control in the hands of managers. Dividend policy is the set of guidelines a company uses to decide how much of its earnings it will pay out to its shareholders. It is an important organizational decision to enable a firm to achieve its objectives and perform efficiently. Any policy that leads to a maximization of a firm's stock price, which in turn leads to the maximization of shareholder wealth, is referred to as an optimal dividend policy (Gul et al., 2012).

Optimum capital structure can be achieved by evacuating the unnecessary cost which ultimately trims down the weighted average cost of capital (Moyer et al., 2004). The study postulated that if the blend of debt, common equity and preferred stocks are rationally weighted, it represents in the firm optimal capital structure. The firm value in the market can be built by its financial capital plus its intelligence capital. The study claimed that intelligence capital can create more of firm value than the financial capital. The dividend payments align the interest of manager and shareholders which ultimately lessen the agency problems. This scenario diminishes the unrestricted finances accessible to managers. La Porta et al. (2000) postulated that owners compel company to disseminate cash in the form of dividend. The study concluded that the cash outflow in the form of dividend is indirectly related with the agency problem. By keeping other things constant, if rights of the shareholders are high, more dividend pay-out is expected in the company. Dividend decisions play very important function to anticipate the future expectation of a firm and also have huge effect on the share market price. This indicates that the decisions connected with dividend are very important for shareholder wealth maximization. DeAngelo et al. (2004) revealed positive and highly significant association of earned equity to total equity with dividend payment decision. Moreover, Mirza and Azfa (2010) found that profitability and operating cash-flow are positively associated with the cash dividend. However, leverage, size, cash flow sensitivity, managerial and individual ownership are negatively associated with the cash dividend. The most significant determinants with dividend behavior are operating cash flow size followed by individual ownership and managerial ownership.

Corporate dividend policy has been the concern of financial managers, and firms at large. Firms are faced with dilemma of paying dividend to stockholders and retaining their earning with the view to reinvesting it back into the business so as to promote further growth of the business. Hassan et al. (2013) concluded that the firm size and profitability are positively related to the dividend pay-out policy. Both dividend and capital structure policies constitute an implicit governance mechanism that determines how much control over the firm's investment decisions is exercised by manager compared to shareholders. Those companies whose dividend pay-out ratio is larger they incline to raise funds by means of debt issue having larger debt ratio (Alli et al., 1993). The study reported that companies having stability in dividend policy and also having financial flexibility are likely to make high dividend pay-out. Likewise, Pruitt and Gitman (1991) indicated that risk affects firms' dividend policy. Firms with high growth rates and high dividend pay-out

ratios utilize debt financing and firms with high leverage compared to their respective industry. Rozeff (1982) argued that the firms to alleviate the agency problems could use dividend pay-out policy. According to the study, if dividends are not paid to the shareholders, the managers will start using these resources for their private benefits. So, dividend policy helps the firms to know that how they can control the agency costs by handling the dividend policy.

Abbas *et al.* (2018) assessed the relationship between dividend pay-out and capital structure in manufacturing sector in Pakistan. The study found high leverage firms have high dividend pay-out ratio. The study argued that the reason behind that is debt is cheaper than capital, the highly geared firms are prone to more dividend payments as high gearing increases profitability and increase in profitability leads to regular and stable dividend pay-out policy. Those firms which pay dividends are usually those that are not able to invest their profit. Dividend is dependent upon firm investment policy. Firms with profitable investment (growth) opportunities consider the profit as a source of financial supply. DeAngelo *et al.* (2000) believed that signalling theory and free cash flows theory are able to explain the effect of dividend policy on firm value in presence of growth opportunities. Iturriaga and Crisóstomo (2010) showed that in presence of growth opportunities, there is a negative relationship between dividend and firm value. The study argued that given the informational asymmetry and growth (investment) opportunities, pay-out of dividend by firm may lead to decrease in firm value. Gursoy and Aydogan (2002) stated that according to free cash flow theory, more intensive dividend policy leads to decrease in funds under control of managers. Thus, firms with no growth opportunities would be able to prevent wastage of scarce resources of firm through profit distribution. Yahia-ZadehFar *et al.* (2010) found that there is a negative significant relationship between growth opportunities (market to book value) and capital structure. Furthermore, Nourvash and Yazdani (2010) showed that there is a negative significant relationship between financial leverage and investment and the relationship is stronger in firms with more growth opportunities.

In Nepalese context, Thapa (2021) examined the impact of net profit, cash flow, size, market to book value, and slack on the dividend pay-out ratio of 19 Nepalese commercial banks. The result showed positive effect of size on the dividend pay-out ratio. However, the results indicated a negative effect of profitability and cash flows on the dividend pay-out ratio of the banks. Similarly, Bhatt and Jain (2020) examined the relationship between the capital structure and the profitability of commercial Banks in Nepal. The study revealed that return on equity is insignificantly and positively related to long term debt and deposits whereas it is negative related to short term debt and total debt. However, Bhaukaje *et al.* (2016) examined the determinants of dividend pay-out of Nepalese commercial banks. The study concluded that profitability, liquidity, credit risk and size are the major determinants of dividend pay-out of Nepalese commercial banks. Likewise, Pradhan and Rajbhandari (2016) concluded that there is a positive relationship of dividend pay-out with size, profitability and lagged dividends. According to the Adhikari (2015), the dividend policy of an enterprise tends to depend on net profits, total assets, lagged dividends, liquidity, risk, investment opportunity set, and number of shareholders.

The above discussion shows that empirical evidences vary greatly across the studies concerning the interrelationship between capital structure and corporate pay-out policy. 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 identify the interrelationship between capital structure and corporate pay-out policy in Nepalese commercial banks. Specifically, it examines the relationship of debt-to-equity

ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size with dividend pay-out ratio and dividend per share of Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on secondary data which were gathered from 16 commercial banks from 2013/14 to 2020/21, leading to a total of 128 observations. The study used stratified sampling method to select the banks. The main sources of data include Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. 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 |
|-------------------------------------|---------------------------------------|-------------------|--------------|
| <b>Public Banks</b>                 |                                       |                   |              |
| 1                                   | Nepal Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 2                                   | Agricultural Development Bank Limited | 2013/14 - 2020/21 | 8            |
| <b>Joint Venture Banks</b>          |                                       |                   |              |
| 3                                   | Nabil Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 4                                   | Nepal SBI Bank Limited                | 2013/14 - 2020/21 | 8            |
| 5                                   | Everest Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 6                                   | Himalayan Bank Limited                | 2013/14 - 2020/21 | 8            |
| 7.                                  | Standard Chartered Bank Nepal Limited | 2013/14 - 2020/21 | 8            |
| <b>Private Banks</b>                |                                       |                   |              |
| 8                                   | NIC Asia Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 9                                   | Global IME Bank Limited               | 2013/14 - 2020/21 | 8            |
| 10                                  | Prime Commercial Bank Limited         | 2013/14 - 2020/21 | 8            |
| 11                                  | Bank of Kathmandu Limited             | 2013/14 - 2020/21 | 8            |
| 12                                  | Machhapuchchhre Bank Ltd.             | 2013/14 - 2020/21 | 8            |
| 13                                  | Prabhu Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 14                                  | Kumari Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 15                                  | Sanima Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 16                                  | Laxmi Bank Limited                    | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                       |                   | <b>128</b>   |

Thus, the study is based on the 128 observations.

## The model

The econometric models employed in this study tries to analyse the impact of capital structure on dividend policy. The dependent variables selected for the study are dividend pay-out ratio and dividend per share. Similarly, the selected independent variables are debt-to-equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size. Therefore, the model takes the following form:

Corporate pay-out policy =  $f \{DTE, DTA, CD, RE, CAR \text{ and } FS\}$

More specifically, the given model has been segmented into following models:

$$DPR_{it} = \beta_0 + \beta_1 DTE_{it} + \beta_2 DTA_{it} + \beta_3 CD_{it} + \beta_4 RE_{it} + \beta_5 CAR_{it} + \beta_6 FS_{it} + e_{it}$$

$$DPS_{it} = \beta_0 + \beta_1 DTE_{it} + \beta_2 DTA_{it} + \beta_3 CD_{it} + \beta_4 RE_{it} + \beta_5 CAR_{it} + \beta_6 FS_{it} + e_{it}$$

Where,

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

DPR = Dividend pay-out ratio as measured by the ratio of dividend per share to earnings per share, in percentage.

DTE = Debt to equity ratio as measured by the ratio of total amount of total liabilities by the total amount of shareholders equity, in ratio.

DTA = Debt to total assets ratio as measured by dividing the total liabilities by total assets, in ratio.

CD = Credit to deposit ratio as measured by the ratio of bank's total amount of loans by the total amount of deposits for the same period, in percentage.

RE = Retained earnings are measured by attaching net earnings to the retained earnings of the previous term, Rs in millions.

CAR = Capital adequacy ratio as measured by the ratio of bank's capital by its risk-weighted assets, in percentage.

FS = Firm size as measured by the total assets of a bank, Rs in million.

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

## Debt to equity ratio

The debt-to-equity ratio indicates how much debt a company is using to finance its assets relative to the value of shareholders' equity. Gill et al. (2010) showed that debt to equity ratio is negative and insignificant determinant of dividend pay-out ratio in both manufacturing and service sectors of US. Similarly, Rahmadi (2020) assessed the influence of return on investment, current ratio, debt to equity ratio, earnings per share, and firm size to the dividend pay-out ratio in banking industries listed at Indonesia Stock Exchange Period 2013-2018. The study showed that debt to equity ratio and dividend pay-out ratio are negatively related. D'Souza (1999) stated that there is statistically significant and negative relationship between debt-to-equity ratio and dividend pay-out. Furthermore, Pruitt and Gitman (1991) also showed that negative relation between debt-to-equity ratio and dividend policy. Likewise, Affandi et al. (2019) also concluded that there is a negative relation between debt-to-equity ratio and dividend pay-out ratio in manufacturing companies. The study also concluded that debt to equity ratio is insignificant determinant of dividend pay-out ratio. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a negative relationship between debt-to-equity ratio and corporate pay-out policy in Nepalese commercial banks.

## Debt to total assets ratio

Helmina and Hidayah (2017) showed that debt to total assets and firm size have a positive and significant effect on dividend pay-out ratio. Similarly, Sunarto (2003) concluded that there is a positive but insignificant relation between dividend pay-out policy and debt to total assets. Similarly, Chang and Rhee (1990) supported a positive association between higher financial leverage in relation to lower shareholder tax rates. It indicates that there is a positive relationship between debt to total assets and dividend policy. Moreover, Ernayani and Sari (2017) analyzed the effect of return on investment, cash ratio, and debt to total assets on the dividend pay-out ratio. The result showed that debt to total assets have positive relationship with dividend pay-out ratio. Moreover, Anton (2016) concluded that debt to total asset ratio and growth have significant positive effect on the dividend pay-out ratio. In addition, Al-Najjar and Hussainey (2009) also revealed that there is positive relation between debt to total assets ratio and dividend pay-out ratio. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a positive relationship between debt to total assets ratio and corporate pay-out policy in Nepalese commercial banks.

## Credit to deposit ratio

Yulianto and Solikhah (2016) showed that the loan to deposit ratio is used to calculate a lending institution's ability to cover withdrawals made by its customers and loans given to its customers are mostly not considered liquid meaning that investments over a longer period of time. A high value of this ratio may negatively influence dividend policy. According to Nadeem et al. (2018), loan deposit ratio has negative correlation with dividend pay-out. It indicates that when banks grant more loans it reduces liquidity of banks which results in payment of low dividend. Similarly, Ramadani and Jumono (2020) showed that return on assets and loan to deposit ratio have negative and significant effect on the dividend pay-out ratio. A high ratio of loans to deposits reduces liquidity position, especially in the form of cash which results in low dividend. Moreover, Yusuf (2015) showed that the loan to deposit ratio has a negative and significant effect on the dividend pay-out ratio. Likewise, Rahma and Syarif (2020) explored the influence of capital adequacy ratios, net interest margins, loan to deposit ratios and non-performing loans on dividend pay-out ratios of banks in Buku Empat. The result showed that loan to deposit ratio has negative and significant impact on dividend per share. Similarly, Nadeem et al. (2018) determined the loan to deposit ratio has a negative and significant impact on dividend pay-out. It explains that an increase in loan deposit ratio results in decrease in dividend payments. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a negative relationship between credit to deposit ratio and corporate pay-out policy in Nepalese commercial banks.

## Retained earning

*Retained earnings* are a firm's cumulative net earnings or profit after accounting for dividends. Moradi et al. (2010) examined the effects of dividends in relation to profitability, size, beta rate, the rate of retained earnings, P/E, and debt ratio. The study concluded that there is a positive relationship between the dividend policy, company's size and rate of retained earnings. Similarly, Margaretha (2015) examined the effect of cash dividends per share, retained earnings per share, earnings per share, and leverage on the stock price of manufacturing industry in Indonesia. The study concluded that there is a positive relationship between

retained earnings and dividend per share. Similarly, Tariq et al. (2014) showed positive relationship of dividends and retained earnings. Likewise, Elim (2019) investigated whether cash dividend tax, institution ownership and retained earnings (RE) influence on dividend policy and their implications on the firm value (FV). The study showed that retained earning has positive and insignificant influence on dividend policy. Furthermore, Ayub (2005) found that profitability, insiders' ownership and retained earnings are positively related to dividend pay-out ratio. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a positive relationship between retained earnings and corporate pay-out policy in Nepalese commercial banks.

## Capital adequacy ratio

Capital adequacy ratio (CAR) is the ratio of a bank's capital in relation to its risk weighted assets and current liabilities. It is decided by central banks and bank regulators to prevent commercial banks from taking excess leverage and becoming insolvent in the process. Zou et al. (2009) concluded that weaker capital adequacy tends to pay less dividends. The banks with higher loan ratios tend to pay less dividends and retain more earnings to undertake the future growth opportunities. Similarly, the banks with higher profitability appear to pay more dividends. Moreover, Nwude and Agbo (2017) determined the relationship of current dividend pay-out and some explanatory variables such as earnings per share, previous year dividend pay-out, capital adequacy ratio, cash flow per share, size, and inflation rate in the Nigerian commercial banks. The study showed that previous year dividend, capital ratio and size of a bank are important factors that positively impact its current year dividend pay-out. Furthermore, Kullab et al. (2022) showed that bank size, profitability, and capital adequacy are the main positive determinants of Palestinian banks' propensity to pay dividends. Similarly, Buigut and Soi (2020) concluded that capital adequacy positively mediates the interaction between leverage and the dividend policy of commercial banks. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a positive relationship between capital adequacy ratio and corporate pay-out policy in Nepalese commercial banks.

## Firm size

Husna and Satria (2019) showed that the current ratio, return on equity and firm size have positive and significant effect on dividend policy. Likewise, Lintner (1956) investigated the relationship between firm size and dividend policy. The study revealed a reciprocal relationship between firm size and the number of dividends given to investors. Furthermore, Lloyd et al. (1985) showed that firm size plays a role to explain dividend pay-out ratio of company concluding a positive response from investors can increase firm value. Moreover, Fama and French (2001) concluded that large firms distribute a higher amount of their net income as cash dividends than do small firms, suggesting a positive relationship between dividend pay-out policy and firm size. William (1985) reported a positive relationship between the size of the firm and their dividend pay-out. However, Jose (2001) found that the size of the firms does not significantly explain the dividend pay-outs. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a positive relationship between firm size and corporate pay-out policy in Nepalese commercial banks.



### 3. Results and discussion

#### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are DPR (Dividend pay-out ratio as measured by the ratio of dividend per share to earnings per share, in percentage) and DPS (Dividend per share as measured by the ratio of total dividend to number of shares outstanding, in Rs). The independent variables are DTE (Debt to equity ratio as measured by the ratio of total amount of total liabilities by the total amount of shareholders equity, in ratio), DTA (Debt to total assets ratio as measured by dividing the total liabilities by total assets, in ratio), CD (Credit to deposit ratio as measured by the ratio of bank's total amount of loans by the total amount of deposits for the same period, in percentage), RE (Retained earnings are measured by attaching net earnings to the retained earnings of the previous term, Rs in millions), CAR (Capital adequacy ratio as measured by the ratio of bank's capital by its risk-weighted assets, in percentage), FS (Firm size as measured by the total assets of a bank, Rs in million).

| Variables | Minimum  | Maximum   | Mean      | Std. Deviation |
|-----------|----------|-----------|-----------|----------------|
| DPR       | 0.00     | 311.41    | 82.91     | 47.01          |
| DPS       | 0.00     | 105.26    | 20.88     | 14.83          |
| DTE       | 4.19     | 14.67     | 8.22      | 2.25           |
| DTA       | 0.60     | 0.99      | 0.87      | 0.07           |
| CD        | 48.92    | 98.08     | 81.73     | 9.73           |
| RE        | -6329.00 | 9922.00   | 1439.26   | 1892.05        |
| CAR       | 4.55     | 22.99     | 13.51     | 2.61           |
| FS        | 21191.00 | 346147.00 | 115699.34 | 62117.66       |

#### 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 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are DPR (Dividend pay-out ratio as measured by the ratio of dividend per share to earnings per share, in percentage) and DPS (Dividend per share as measured by the ratio of total dividend to number of shares outstanding, in Rs). The independent variables are DTE (Debt to equity ratio as measured by the ratio of total amount of total liabilities by the total amount of shareholders equity, in ratio), DTA (Debt to total assets ratio as measured by dividing the total liabilities by total assets, in ratio), CD (Credit to deposit ratio as measured by the ratio of bank's total amount of loans by the total amount of deposits for the same period, in percentage), RE (Retained earnings are measured by attaching net earnings to the retained earnings of the previous term, Rs in millions), CAR (Capital adequacy ratio as measured by the ratio of bank's capital by its risk-weighted assets, in percentage), FS (Firm size as measured by the total assets of a bank, Rs in million).

| Variables | DPR     | DPS    | DTE     | DTA | CD | RE | CAR | FS |
|-----------|---------|--------|---------|-----|----|----|-----|----|
| DPR       | 1       |        |         |     |    |    |     |    |
| DPS       | 0.564** | 1      |         |     |    |    |     |    |
| DTE       | -0.111  | -0.011 | 1       |     |    |    |     |    |
| DTA       | 0.046   | 0.180* | 0.358** | 1   |    |    |     |    |



|            |         |          |          |        |         |         |         |
|------------|---------|----------|----------|--------|---------|---------|---------|
| <b>CD</b>  | 0.081   | -0.309** | 0.007    | -0.149 | 1       |         |         |
| <b>RE</b>  | 0.252** | 0.234**  | -0.086   | -0.042 | 0.156   | 1       |         |
| <b>CAR</b> | 0.318** | 0.199*   | -0.451** | -0.151 | -0.006  | 0.417** | 1       |
| <b>FS</b>  | 0.016   | -0.009   | -0.117   | -0.072 | 0.348** | 0.474** | 0.278** |
|            |         |          |          |        |         |         | 1       |

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

Table 3 shows that there is a negative relationship between debt-to-equity ratio and dividend pay-out ratio. It indicates that higher the debt-to-equity ratio, lower would be the dividend pay-out ratio. Similarly, there is a positive relationship between debt to total assets ratio and dividend pay-out ratio. It indicates that higher the debt to total assets ratio, higher would be the dividend pay-out ratio. Likewise, credit to deposit ratio is positively related to dividend pay-out ratio. It indicates that higher the credit to deposit ratio, higher would be the dividend pay-out ratio. Moreover, retained earnings is positively related to dividend pay-out ratio. It indicates that higher the retained earnings, higher would be the dividend pay-out ratio. Furthermore, there is a positive relationship between capital adequacy ratio and dividend pay-out ratio. It indicates that higher the capital adequacy ratio, higher would be the dividend pay-out ratio. Likewise, there is a positive relationship between firm size and dividend pay-out ratio. It indicates that larger the firm size, higher would be the dividend pay-out ratio.

On the other hand, the result also shows that there is a negative relationship between debt-to-equity ratio and dividend per share. It indicates that higher the debt-to-equity ratio, lower would be the dividend per share. Similarly, debt to total assets ratio is positively related to dividend per share. It indicates that higher the debt to total assets ratio, higher would be the dividend per share. Likewise, there is a negative relationship between credit to deposit ratio and dividend per share. It indicates that higher the credit to deposit ratio, lower would be the dividend per share. Moreover, retained earnings is positively related to dividend per share. It indicates that higher the retained earnings, higher would be the dividend per share. Furthermore, there is a positive relationship between capital adequacy ratio and dividend per share. It indicates that higher the capital adequacy ratio, higher would be the dividend per share. Likewise, there is a positive relationship between firm size and dividend per share. It indicates that larger the firm size, higher would be the dividend 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. More specifically, it shows the regression results of debt-to-equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size on dividend pay-out ratio of Nepalese commercial banks.

**Table 02:** Regression results of debt-to-equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio, firm size on dividend payout ratio

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $DPR_{it} = \beta_0 + \beta_1 DTE_{it} + \beta_2 DTA_{it} + \beta_3 CD_{it} + \beta_4 RE_{it} + \beta_5 CAR_{it} + \beta_6 FS_{it} + e_{it}$ , where the dependent variable is DPR (Dividend pay-out ratio as measured by the ratio of dividend per share to earnings per share, in percentage). The independent variables are DTE (Debt to equity ratio as measured by the ratio of total amount of total liabilities by the total amount of shareholders equity, in ratio), DTA (Debt to total assets ratio as measured by dividing the total liabilities by total assets, in ratio), CD (Credit to deposit ratio as measured by the ratio of bank's total amount of loans by the total amount of deposits for the same period, in percentage), RE (Retained earnings are measured by attaching net earnings to the retained earnings of the previous term, Rs in millions), CAR (Capital adequacy ratio as measured by the ratio of bank's capital by its risk-weighted assets, in percentage), FS (Firm size as measured by the total assets of a bank, Rs in million).

| Models | Intercepts           | Regression coefficients of |                   |                  |                    |                    |                    | Adj. R_bar <sup>2</sup> | SEE    | F-value |
|--------|----------------------|----------------------------|-------------------|------------------|--------------------|--------------------|--------------------|-------------------------|--------|---------|
|        |                      | DTE                        | DTA               | CD               | RE                 | CAR                | FS                 |                         |        |         |
| 1      | 101.909<br>(6.463)** | -2.310<br>(1.249)          |                   |                  |                    |                    |                    | 0.017                   | 46.910 | 1.560   |
| 2      | 56.471<br>(1.095)    |                            | 30.567<br>(0.515) |                  |                    |                    |                    | 0.010                   | 47.150 | 0.261   |
| 3      | 50.978<br>(1.443)    |                            |                   | 0.391<br>(0.911) |                    |                    |                    | 0.012                   | 47.045 | 0.832   |
| 4      | 48.163<br>(3.837)**  |                            |                   |                  | 5.388<br>(2.924)** |                    |                    | 0.061                   | 45.676 | 8.554   |
| 5      | 5.500<br>(0.262)     |                            |                   |                  |                    | 5.731<br>(3.760)** |                    | 0.092                   | 44.756 | 14.144  |
| 6      | 66.645<br>(0.739)    |                            |                   |                  |                    |                    | 1.412<br>(0.181)   | 0.011                   | 47.194 | 0.034   |
| 7      | 51.417<br>(1.001)    | -3.041<br>(1.536)          | 65.318<br>(1.032) |                  |                    |                    |                    | 0.002                   | 46.898 | 1.317   |
| 8      | 3.497<br>(0.052)     | -3.184<br>(1.606)          | 76.833<br>(1.199) | 0.479<br>(1.105) |                    |                    |                    | 0.011                   | 46.857 | 1.282   |
| 9      | -15.891<br>(0.241)   | -2.727<br>(1.404)          | 74.466<br>(1.191) | 0.297<br>(0.694) | 5.041<br>(2.688)** |                    |                    | 0.050                   | 45.722 | 2.827   |
| 10     | -93.536<br>(1.318)   | -0.329<br>(0.156)          | 73.403<br>(1.202) | 0.381<br>(0.909) | 2.752<br>(1.355)   | 4.942<br>(2.615)** |                    | 0.101                   | 44.674 | 3.732   |
| 11     | 76.094<br>(0.706)    | -0.533<br>(0.256)          | 76.135<br>(1.263) | 0.675<br>(1.542) | 4.455<br>(2.056)*  | 5.324<br>(2.841)** | 18.266<br>(2.069)* | 0.125                   | 44.085 | 3.911   |

**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.
- Dividend pay-out ratio is the dependent variable.

Table 4 shows that the beta coefficients for debt-to-equity ratio are negative with dividend pay-out ratio. It indicates that debt to equity ratio has a negative impact on dividend pay-out ratio. This finding is similar to the findings of Rahmadi (2020). Similarly, the beta coefficients for debt to total assets ratio are positive with dividend pay-out ratio. It indicates that debt to total assets ratio has positive impact on dividend pay-out ratio. This finding is consistent with the findings of Ernayani and Sari (2017). Likewise, the beta coefficient for credit to deposit ratio are positive with dividend pay-out ratio. It indicates that credit to deposit ratio

has a positive impact on dividend pay-out ratio. This finding is similar to the findings of Rahma and Syarif (2020). Furthermore, the beta coefficients for retained earnings are positive with dividend pay-out ratio. It indicates that retained earnings has positive impact on dividend pay-out ratio. This finding is consistent with the findings of Ayub (2005). Likewise, the beta coefficients for capital adequacy ratio are positive with dividend pay-out ratio. It indicates that capital adequacy ratio has positive impact on dividend pay-out ratio. This finding is similar to the findings of Buigut and Soi (2020).

Table 5 shows the estimated regression result of debt-to-equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size on dividend per share of Nepalese commercial banks.

**Table 03:** Estimated regression results of debt-to-equity ratio, debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size on dividend per share

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $DPS_{it} = \beta_0 + \beta_1 DTE_{it} + \beta_2 DTA_{it} + \beta_3 CD_{it} + \beta_4 RE_{it} + \beta_5 CAR_{it} + \beta_6 FS_{it} + e_{it}$ , where the dependent variable is DPS (Dividend per share as measured by the ratio of total dividend to number of shares outstanding, in Rs). The independent variables are DTE (Debt to equity ratio as measured by the ratio of total amount of total liabilities by the total amount of shareholders equity, in ratio), DTA (Debt to total assets ratio as measured by dividing the total liabilities by total assets, in ratio), CD (Credit to deposit ratio as measured by the ratio of bank's total amount of loans by the total amount of deposits for the same period, in percentage), RE (Retained earnings are measured by attaching net earnings to the retained earnings of the previous term, Rs in millions), CAR (Capital adequacy ratio as measured by the ratio of bank's capital by its risk-weighted assets, in percentage), FS (Firm size as measured by the total assets of a bank, Rs in million).

| Models | Intercepts          | Regression coefficients of |                    |                     |                    |                    |                   | Adj. R_bar <sup>2</sup> | SEE    | F-value |
|--------|---------------------|----------------------------|--------------------|---------------------|--------------------|--------------------|-------------------|-------------------------|--------|---------|
|        |                     | DTE                        | DTA                | CD                  | RE                 | CAR                | FS                |                         |        |         |
| 1      | 21.494<br>(4.295)** | -0.074<br>(0.127)          |                    |                     |                    |                    |                   | 0.010                   | 14.891 | 0.021   |
| 2      | -11.847<br>(0.740)  |                            | 37.834<br>(2.050)* |                     |                    |                    |                   | 0.021                   | 14.649 | 4.202   |
| 3      | 59.423<br>(5.590)** |                            |                    | -0.472<br>(3.651)** |                    |                    |                   | 0.090                   | 14.162 | 13.334  |
| 4      | 10.688<br>(2.686)** |                            |                    |                     | 1.581<br>(2.706)** |                    |                   | 0.051                   | 14.477 | 7.325   |
| 5      | 5.600<br>(0.819)    |                            |                    |                     |                    | 1.131<br>(2.276)** |                   | 0.030                   | 14.595 | 5.182   |
| 6      | 23.660<br>(0.831)   |                            |                    |                     |                    |                    | -0.241<br>(0.098) | 0.011                   | 14.891 | 0.011   |
| 7      | -12.796<br>(0.797)  | -0.571<br>(0.922)          | 44.359<br>(2.243)* |                     |                    |                    |                   | 0.022                   | 14.658 | 2.527   |
| 8      | 30.659<br>(1.516)   | -0.442<br>(0.740)          | 33.916<br>(1.759)  | -0.434<br>(3.331)** |                    |                    |                   | 0.104                   | 14.100 | 5.521   |
| 9      | 23.157<br>(1.190)   | -0.265<br>(0.462)          | 33.000<br>(1.789)  | -0.504<br>(3.994)** | 1.951<br>(3.525)** |                    |                   | 0.175                   | 13.492 | 7.636   |
| 11     | 11.893<br>(0.556)   | -0.083<br>(0.131)          | 32.846<br>(1.785)  | -0.492<br>(3.895)** | 1.618<br>(2.646)** | 0.717<br>(1.259)   |                   | 0.181                   | 13.460 | 6.458   |
| 12     | 24.085<br>(0.729)   | -0.069<br>(0.108)          | 33.043<br>(1.789)  | -0.471<br>(3.516)** | 1.741<br>(2.624)** | 0.744<br>(1.297)   | -1.313<br>(0.486) | 0.171                   | 13.502 | 5.384   |

**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. Dividend per share is the dependent variable.

Table 5 shows the beta coefficients for debt-to-equity ratio are negative with dividend per share. It indicates that debt-to-equity ratio has a negative impact on dividend per share. This finding is similar to the findings of Pruitt and Gitman (1991). Similarly, the beta coefficients for debt to total assets ratio are positive with dividend per share. It indicates that debt to total assets ratio has positive impact on dividend per share. This finding is consistent with the findings of Chang and Rhee (1990). Likewise, the beta coefficients for credit to deposit ratio are negative with dividend per share. It indicates that credit to deposit ratio has negative impact on dividend per share. This finding is similar to the findings of Nadeem et al. (2018). Furthermore, the beta coefficients for capital adequacy ratio are positive with dividend per share. It indicates that capital adequacy ratio has a positive impact on dividend per share. This finding is consistent with the findings of Kullab et al. (2022). Similarly, the beta coefficients for firm size are positive with dividend per share. It indicates that firm size has a positive impact on dividend per share. This finding is similar to the findings of Fama and French (2001).

## 4. Summary and conclusion

Capital structure refers to the amount of debt and/or equity employed by a firm to fund its operations and finance its assets. A firm's capital structure is typically expressed as a debt-to-equity or debt-to-capital ratio. Debt and equity capital are used to fund a business's operations, capital expenditures, acquisitions, and other investments. Dividend policy is one of the questions profitable companies faces. Firms are faced with dilemma of distributing income to shareholders or investing back their earnings in operating assets, securities, or used to retire bond so as to foster further growth of the business. The decision of the firm concerning how much earnings should be distributed, how stable should the distribution be, and how much should be retained is the concern of dividend policy decision.

This study attempts to examine the effect of capital structure on corporate pay-out policy in the context of Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study showed that debt to total assets ratio, credit to deposit ratio, retained earnings, capital adequacy ratio and firm size have positive impact on dividend pay-out ratio. However, debt-to-equity ratio has a negative impact on dividend pay-out ratio. Similarly, debt to total assets ratio, retained earnings and capital adequacy ratio have positive impact on dividend per share. However, debt-to-equity ratio credit to deposit ratio and firm size have a negative impact on dividend per share. Likewise, the study concluded that capital adequacy ratio followed by retained earnings is the most influencing factor that explains the changes in the dividend pay-out ratio of Nepalese commercial banks. Similarly, the study also concluded that credit to deposit ratio followed by retained earnings and debt to assets ratio is the most influencing factor that explain the changes in the dividend per share in context of Nepalese commercial banks.

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PART 3

# Capital Market



## Abstract

*The study examines the impact of liquidity and bank size on the profitability of Nepalese commercial banks. Return on assets and net interest margin are selected as the dependent variables. The selected independent variables are current ratio, cash reserve ratio, loan to assets ratio, total assets, total number of branches and total deposits. The study is based on secondary data of 22 commercial banks with 154 observations for the period from 2013/14 to 2019/20. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, publications and websites of Nepal Rastra Bank (NRB) and Ministry of Finance (MoF) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of liquidity and bank size on the profitability of Nepalese commercial banks.*

*The study showed that current ratio has a positive impact on return on assets and net interest margin. It indicates that higher the current ratio, higher would be the return on assets and net interest margin. Similarly, cash reserve ratio has a positive impact on return on assets and net interest margin. It indicates that increase in cash reserve ratio leads to increase in return on assets and net interest margin. Furthermore, loan to assets ratio has a negative impact on return on assets. It indicates that higher the loan to assets ratio, lower would be the return on assets and net interest margin. Moreover, total asset has a positive impact on return on assets and net interest margin. It indicates that higher the total assets, higher would be the return on assets. However, number of branches has a positive impact on return on assets and net interest margin. It indicates that higher the number of branches, higher would be the return on assets and net interest margin. Furthermore, total deposits have positive impact on return on assets and net interest margin. It indicates that increase in total deposits leads to increase in return on assets and net interest margin.*

**Key words:** Return on assets, net interest margin, current ratio, cash reserve ratio, loan to assets ratio, total assets, number of branches and total deposits.

# 1. Introduction

In the competitive banking world, banks are surviving through enhancing their performance and efficiency. Bank's profitability depends on some internal and external factors. These factors make an effort to fluctuate the net earnings of a bank. A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Liquidity helps a bank to reduce the chance of bank's failure to pay its depositors in regular transactions (Kumer and Sayani, 2015). Alshatti (2015) stated that it is essential to assure proper liquidity management for increasing the profitability of the banks. Liquidity crises are not new phenomena and banks have endured them throughout history. 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). A bank must manage its liability and asset sides in order to be able to meet the additions to, and withdrawals from, the accounts. Banks, therefore, are exposed to the risk that they will not have sufficient liquid assets to meet random demands from the depositors (Gatev et al., 2007). Moreover, liabilities of banks typically have shorter maturities than assets, and therefore banks must permanently control funding of their balance sheet structure depending upon maturity transformation. As a result, a repeatedly re-financing circle which is a part of the banking business unavoidably exposes banks to liquidity risk (Bonfim and Kim, 2012).

According to Greuning and Bratton (2004), liquidity management is a tool which is to be followed by the banks as a decisional structure for managing liquidity risk. 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). A firm should ensure that it does not suffer from lack of or excess liquidity to meet its short-term compulsions. Lack of cash or liquid assets on hand may force a company to miss the incentives given by the suppliers of credit, services, and goods. Loss of such incentives may result in higher cost of goods which in turn affect the profitability of the business. Therefore, there is always a need for the company to maintain certain degree of liquidity (Anthony, 2012). Liquidity management is important to financial management decision. The optimal liquidity management can be accomplished by a company that manage the trade-off between profitability and liquidity management (Bhunia and Khan, 2011). Owolabi and Obida (2012) defined profitability as the ability to make profit from all the business activities of an enterprise. It measures management efficiency in the use of organizational resources in adding value to the business.

Liquidity plays a crucial role in the successful operation of a banking business. Every stakeholder is interested in the liquidity position of a bank (Kurawa and Abubakar, 2014). Lartey et al. (2013) found that there is a weak positive relationship between the liquidity and the profitability of the listed banks in Ghana. Similarly, Wambu (2013) found that there is a positive relationship between profitability and liquidity of commercial banks in Kenya. Likewise, Almazari (2014) found that there is a positive correlation between profitability measured by ROA and liquidity ratio of Saudi and Jordanian banks. Similarly, Maudos and Guevara (2004) stated that there is a significant positive relationship between market liquidity risk and net interest income. Likewise, Drakos (2003) revealed that there is a negative relationship between net interest margin and liquidity. However, Maudos and Solis (2009) found an insignificant relationship between net interest margin and market liquidity. Anggari and Dana (2020) found that bank size has a positive and significant effect on the profitability of banking companies listed on the Indonesia stock exchange. Similarly, Irawati and Maksum (2017) revealed that firm size has a positive and significant effect on profitability (ROA). The study also showed that larger the firm, higher would be the level of profitability. Demircuc-Kunt and Levine (1996) showed that there is a positive relationship between bank size and performance level. The study found that higher funds can easily meet their rigid capitals so that they can have extra funds for giving

loans to borrowers and thereby increase their profits and earning levels. Aladwan (2015) found that there is a significant positive relationship of bank size with profitability. The study concluded that small and medium sized banks exhibit higher performance compared to large banks.

Puspitasari *et al.* (2019) revealed that the capital adequacy ratio, operating costs, and loan to deposit ratio have a negative and significant influence on return on asset. However, non-performing loan and the inflation rate are insignificant determinant of the performance of return on assets in Indonesian banks. Ali (2016) investigated the determinants of profitability in the case of Jordanian commercial banks. The study concluded that there is a positive association between capital adequacy ratio and banks' profitability. Similarly, Padilla and Pagano (1997) confirmed a positive association between capital adequacy ratio and financial performance. Furthermore, Roman and Danuletiu (2013) concluded that capital adequacy has a positive relationship with profitability. Similarly, Berger (1995) found evidence for a positive relationship between the ratios of capital to asset and returns on equity. Al-Sabbagh (2004) reported a positive relationship between profitability and capital adequacy of commercial banks. Furthermore, Sharifi and Akhter (2016) found that credit deposit ratio has positive impact on public sector bank's financial performance. Roy (2008) explained that large banks can carry out a large number of different activities. They can diversify their business portfolio and hence, credit risk will be decreased and performance will be increased. Further, Kaynak and Kuan (1993) found that firm size has a positive relationship with performance implying that bigger firms are expected to achieve better performance.

When banks hold a lower amount of liquid assets they are more vulnerable to large deposit withdrawals. Ruziqa (2013) analyzed the impact of credit and liquidity risk on bank performance of Indonesian conventional banks. The study argued that liquidity risk negatively influences the return on assets of the banks. Similarly, Pasiouras and Kosmidou (2007) assessed the factors influencing the profitability of domestic and foreign commercial banks in the European Union. The study found a negative relationship between liquidity ratio and profitability. In addition, Guru (2002) examined the determinants of commercial bank profitability in Malaysia. The study found a negative relationship between liquidity and bank profitability.

In the context of Nepal, Pradhan and Shrestha (2016) revealed that there is a positive and significant impact of liquidity on bank profitability. Similarly, Magar (2016) found that there is a positive relationship of liquidity and firm size with bank profitability measured in terms of return on assets. Bam *et al.* (2015) revealed that profitability (ROA) is positively related to asset composition or assets size. Bajracharya (2019) analyzed the capital structure and its impact on financial performance in insurance companies of Nepal. The study stated that there is a positive relationship of return on assets with liquidity and total assets. Likewise, Parajuli (2016) assessed the effects of factors influencing the profitability of domestic and foreign commercial bank of Nepal. The study revealed that liquidity has a positive impact on profitability of banking sector. Pradhan and Shrestha (2018) revealed that liquidity ratio has a negative and significant impact on return on assets and earning per share. Uday *et al.* (2019) found that there is a positive relationship between liquidity ratios and profitability that indicates the higher the quick ratio, higher would be the return on assets. Pal *et al.* (2019) revealed that loan to deposit ratio, non-performing loan and reserve requirement ratio are negatively related to return on assets. It indicates that higher the reserve requirement ratio, lower would be the return on assets. Similarly, reserve requirement is negatively related to net interest margin. It means higher the reserve requirement lower would be the net interest margin. Bist *et al.* (2019) found that leverage, liquidity ratio and credit to core capital plus deposit ratio are positively correlated to return on assets which indicates that increase in the liquidity ratio will leads to increase in the return on assets. Bariya *et al.* (2016) found that there is a positive relationship between liquidity and profitability. It indicates

the higher the liquidity higher would be the return on and assets. However there is a negative relationship between liquidity and net interest margin which indicates that higher the liquidity, lower would be the net interest margin.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of liquidity and bank size on the 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 impact of liquidity and bank size on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of current ratio, cash reserve ratio, loan to assets ratio, total assets, number of branches and total deposits with return on assets and net interest margin 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 and discusses the implications of the study findings.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 27 Nepalese commercial banks from 2013/14 to 2019/20, leading to a total of 154 observations. The main sources of data include publications and websites of Nepal Rastra Bank (NRB), Ministry of Finance (MoF), 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 | 2013/14-2019/20 | 7            |
| 2     | Bank of Kathmandu Limited             | 2013/14-2019/20 | 7            |
| 3     | Century Commercial Bank Limited       | 2013/14-2019/20 | 7            |
| 4     | Rastriya Banijya Bank Limited         | 2013/14-2019/20 | 7            |
| 5     | Civil Bank Limited                    | 2013/14-2019/20 | 7            |
| 6     | Global IME Bank Limited               | 2013/14-2019/20 | 7            |
| 7     | Himalayan Bank Limited                | 2013/14-2019/20 | 7            |
| 8     | Kumari Bank Limited                   | 2013/14-2019/20 | 7            |
| 9     | Laxmi Bank Limited                    | 2013/14-2019/20 | 7            |
| 10    | Machhapuchchhre Bank Limited          | 2013/14-2019/20 | 7            |
| 11    | Mega Bank Nepal Limited               | 2013/14-2019/20 | 7            |
| 12    | Nabil Bank Limited                    | 2013/14-2019/20 | 7            |
| 13    | Sanima Bank Limited                   | 2013/14-2019/20 | 7            |
| 14    | Nepal Bank Limited                    | 2013/14-2019/20 | 7            |

|                                     |                                        |                 |            |
|-------------------------------------|----------------------------------------|-----------------|------------|
| 15                                  | Nepal Credit and Commerce Bank Limited | 2013/14-2019/20 | 7          |
| 16                                  | Siddhartha Bank Limited                | 2013/14-2019/20 | 7          |
| 17                                  | Nepal SBI Bank Limited                 | 2013/14-2019/20 | 7          |
| 28                                  | NIC Asia Bank Limited                  | 2013/14-2019/20 | 7          |
| 19                                  | Everest Bank Limited                   | 2013/14-2019/20 | 7          |
| 20                                  | Prabhu Bank Limited                    | 2013/14-2019/20 | 7          |
| 21                                  | Standard Chartered Bank Nepal Limited  | 2013/14-2019/20 | 7          |
| 22                                  | Sunrise Bank Limited                   | 2013/14-2019/20 | 7          |
| <b>Total number of observations</b> |                                        |                 | <b>154</b> |

Thus, the study is based on the 154 observations.

## The model

The model used in this study assumes that profitability depends on liquidity and bank size. The dependent variables selected for the study are return on assets and net interest margin. Similarly, the selected independent variables in this study are current ratio, cash reserve ratio loan to assets ratio, total assets, number of branches and total deposits. The following model equations are designed to test the hypothesis.

$$ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CRR_{it} + \beta_3 LTAR_{it} + \beta_4 TA_{it} + \beta_5 NOB_{it} + \beta_6 TD_{it} + e_{it}$$

$$NIM_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CRR_{it} + \beta_3 LTAR_{it} + \beta_4 TA_{it} + \beta_5 NOB_{it} + \beta_6 TD_{it} + e_{it}$$

Where,

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

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

CR = Current ratio as measured by current assets to current liabilities, in times.

CRR = Cash reserve ratio as measured by reserve requirement to bank deposits, in percentage.

LTAR = Loan to assets ratio as measured by total loan outstanding to total assets, in percentage.

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

NOB = Number of branches, in number.

TD = Total deposit as measured by total deposit of a bank, Rupees in million.

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

## Current ratio

Current ratio is a measure of a commercial bank's short-term solvency. Renato (2010) revealed that the current ratio has a significant positive correlation with the profitability of the firms. Khan and Khokhar (2015) stated that there is a positive relationship between current ratio and return on assets of the companies in Saudi Arabia. Similarly, Ofoegbu and Onodugo (2016) showed that the current ratio and profitability of the companies' studies are significantly and positively related. Moreover, Maqsood et al. (2016) found that there is a significant and positive relationship between current ratio and profitability. Bourke (1989) showed that there is a positive significant link between bank liquidity and profitability. Furthermore, Ismail (2016) found that liquidity ratios such as current ratio and cash conversion cycle have significant positive

impact on profitability (ROA). High current ratio and longer cash conversion cycle leads firms towards better performance. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a positive relationship between current ratio and bank profitability.

## Cash reserve ratio

Cash reserve ratio is the minimum liquid cash amount in a proportion of its total deposit that is required to be kept either in the bank or deposited in the central bank, in such a way that the bank cannot access it for any business or economic activity. Kaur and Silky (2013); Malik and Ahmed (2013) found that there is a negative association between cash reserve ratio and profitability. The study supports the trade-off theory of liquidity and profitability. Any increase in liquidity will cause a diminishing trend in asset utilization capability of the firm. Bhunia et al. (2011) revealed that the cash reserve ratio is negatively associated with bank profitability. Likewise, Ajanthan (2013) stated that there is significant negative relationship between quick ratio, cash reserve ratio and profitability. In addition, Haq et al. (2011) showed that reserve ratio and liquidity ratio are negatively related to return on assets (profitability). Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a negative relationship between cash reserve ratio and bank profitability.

## Loan to assets ratio

Tam (2020) showed that loan to deposit ratio has a significant positive influence on banks' profitability. Tan and Floros (2012) analyzed relationship between bank profitability and inflation of China from 2003-2009. The results of the study showed that bank size and loan to assets ratio has significant positive effect on ROA (profitability). Isik and Belke (2017) showed that size has a significant negative effect on NIM. Similarly, loan to assets ratio has a significant positive effect on NIM (profitability). Saeed (2014) stated that bank size, and loan to assets ratio (LAR) have a positive effect on return on assets. Roman and Danuletiu (2013) found that equity to assets ratio (EAR) and loan to assets ratio (LAR) have significant positive effect on ROA (profitability). Chronopoulos et al. (2015) found that there is a significant positive effect of loan to assets ratio on bank profitability. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a positive relationship between loan to total assets and bank profitability.

## 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. Das (2003) revealed that there is a positive relationship between size (total assets) and profitability ratios. Similarly, Alkassim (2005) showed that the total asset is positively related to the profitability of Jordanian commercial banks. Likewise, Haron (2004) found that size (total assets) is positively related 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.

H<sub>4</sub>: There is a positive relationship between total assets and bank profitability.



## Number of branches

Number of branches is highly significant and affect the bank profitability of developed and developing countries. Berger et al. (1997) found that there is a positive and significant relationship between number of branches and firm profitability. Akhavein (2005) showed that number of branches and size are positively related to the profitability of banking system. According to Soteriou and Zenios (1997), number of branches have significant positive relationship with the profitability which increases the bank efficiency along with service quality and operations simultaneously. Saloner and Shepard (1995) revealed that number of branches have positive and significant impact on bank profitability. Al-Homaidi et al. (2018) stated that the number of branches is the most significant bank-specific determinants that influence the banks' profitability. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a positive relationship between number of branches and bank profitability.

## Total deposits

Deposits are the main source of bank funding and has an impact on the profitability of the banks. Javaid et al. (2011) showed that deposits have significant positive impact on bank profitability. In addition, Gul et al. (2011) found that deposits have significant positive association with the return on asset (ROA), return on equity (ROE), return on capital employed (ROCE) and net interest margin (NIM). Similarly, Velnampy and Nimalathasan (2007) found that deposits are positively correlated to the profitability ratios. Demircuc-Kunt and Maksimovic (1998) stated that there is a positive relationship between size, deposits and profitability. Athanasoglou et al. (2005) showed that size, capital, loans and deposits have positive relationship with bank profitability. Lee and Hsieh (2013) stated that deposits are positively related to bank profitability. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a positive relationship between total deposits 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 2013/14 to 2019/20.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 22 Nepalese commercial banks for the study period from 2013/14 to 2019/20. The dependent variables are ROA (Return on assets as measured by net profit to total assets, 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 CR (Current ratio as measured by current assets to current liabilities, in times), CRR (Cash reserve ratio as measured by reserve requirement to bank deposits, in percentage), LTAR (Loan to assets ratio as measured by total loan outstanding to total assets, in percentage), TA (Total assets as measured by total assets of bank, Rs. in billion), NOB (Number of banks, in number), and TD (Total deposit as measured by total deposit of a bank, Rs. in million).

| Variables | Minimum  | Maximum   | Mean     | Std. Deviation |
|-----------|----------|-----------|----------|----------------|
| ROA       | -1.44    | 3.57      | 1.58     | 0.58           |
| NIM       | 1.24     | 5.60      | 3.24     | 0.68           |
| CR        | 0.65     | 1.37      | 0.97     | 0.09           |
| CRR       | 2.86     | 35.14     | 15.88    | 8.97           |
| LTAR      | 42.63    | 77.82     | 67.87    | 7.19           |
| TA        | 20.57    | 274.08    | 96.76    | 52.79          |
| NOB       | 0.00     | 330.00    | 82.73    | 62.54          |
| TD        | 17148.00 | 212315.39 | 78765.55 | 41193.88       |

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 22 Nepalese commercial banks for the study period from 2013/14 to 2019/20. The dependent variables are ROA (Return on assets as measured by net profit to total assets, 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 CR (Current ratio as measured by current assets to current liabilities, in times), CRR (Cash reserve ratio as measured by reserve requirement to bank deposits, in percentage), LTAR (Loan to assets ratio as measured by total loan outstanding to total assets, in percentage), TA (Total assets as measured by total assets of bank, Rs in billion), NOB (Number of banks, in numbers) and TD (Total deposit as measured by total deposit of a bank, Rs in million).

| Variables | ROA     | NIM     | CR      | CRR    | LTAR    | TA      | NOB     | TB |
|-----------|---------|---------|---------|--------|---------|---------|---------|----|
| ROA       | 1       |         |         |        |         |         |         |    |
| NIM       | 0.486** | 1       |         |        |         |         |         |    |
| CR        | 0.117   | 0.065   | 1       |        |         |         |         |    |
| CRR       | 0.176*  | 0.126   | -0.023  | 1      |         |         |         |    |
| LTAR      | -0.141  | -0.090  | 0.526** | 0.038  | 1       |         |         |    |
| TA        | 0.268** | 0.212** | 0.059   | -0.042 | -0.158  | 1       |         |    |
| NOB       | 0.154   | 0.406** | 0.089   | 0.100  | -0.024  | 0.700** | 1       |    |
| TD        | 0.282** | 0.203*  | 0.002   | -0.023 | -0.175* | 0.993** | 0.679** | 1  |

Source: SPSS output

**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 current ratio and return on assets. It indicates that higher the current ratio, higher would be the return on assets. Similarly, there is a positive relationship between cash reserve ratio and return on assets. It indicates that increase in cash reserve ratio leads to increase in return on assets. Furthermore, there is a negative relationship between loan to assets ratio and return on assets. It indicates that higher the loan to assets ratio, lower would be the return on assets. Moreover, there is a positive relationship between total assets and return on assets. It indicates that higher the total assets, higher would be the return on assets. However, there is a positive relationship between number of branches and return on assets. It indicates that higher the number of branches, higher would be the return on assets. Furthermore, there is a positive relationship between total deposits and return on assets. It indicates that increase in total deposits leads to increase in return on assets.

Similarly, the result also shows that there is a positive relationship between current ratio and net interest margin. It indicates that higher the current ratio, higher would be the net interest margin. Moreover, there is a positive relationship between cash reserve ratio and net interest margin. It indicates that increase in cash reserve ratio leads to increase in net interest margin. In contrast, there is a negative relationship between loan to assets ratio and net interest margin. It indicates that higher the loan to assets ratio, lower would be the net interest margin. Furthermore, there is a positive relationship between total assets and net interest margin. It indicates that higher the total assets, higher would be the net interest margin. Likewise, there is a positive relationship between number of branches and net interest margin. It indicates that increase in number of branches leads to increase in net interest margin. Moreover, there is a positive relationship between total deposits and net interest margin. It indicates that higher the total deposits, higher would be the net interest margin.

## **Regression analysis**

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of current ratio, cash reserve ratio, loan to assets ratio, total assets, number of branches and total deposits on return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of current ratio, cash reserve ratio, loan to assets ratio, total assets, number of branches and total deposits with return on assets

The results are based on panel data of 22 commercial banks with 154 observations for the period of 2013/14-2019/20 by using the linear regression model and the model is  $ROA_{it} = \beta_0 + \beta_1 CR_{it} + \beta_2 CRR_{it} + \beta_3 LTAR_{it} + \beta_4 TA_{it} + \beta_5 NOB_{it} + \beta_6 TD_{it} + \epsilon_{it}$  where, the dependent variables are ROA (Return on assets as measured by net profit to total assets, 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 CR (Current ratio as measured by current assets to current liabilities, in times), CRR (Cash reserve ratio as measured by reserve requirement to bank deposits, in percentage), LTAR (Loan to assets ratio as measured by total loan outstanding to total assets, in percentage), TA (Total assets as measured by total assets of bank, Rs in billion), NOB (Number of banks, in numbers) and TD (Total deposit as measured by total deposit of a bank, Rs in million).

| Model | Intercept           | Regression coefficients of |                   |                     |                    |                   |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|-------------------|---------------------|--------------------|-------------------|--------------------|-------------------------|-------|---------|
|       |                     | CR                         | CRR               | LTAR                | TA                 | NOB               | TD                 |                         |       |         |
| 1     | 0.887<br>(1.846)    | 0.118<br>(1.455)           |                   |                     |                    |                   |                    | 0.007                   | 0.577 | 2.118   |
| 2     | 1.403<br>(14.937)** |                            | 0.311<br>(2.209)* |                     |                    |                   |                    | 0.025                   | 0.572 | 4.880   |
| 3     | 2.355<br>(5.339)**  |                            |                   | -0.011<br>(1.759)   |                    |                   |                    | 0.014                   | 0.575 | 3.094   |
| 4     | 1.299<br>(13.758)** |                            |                   |                     | 1.003<br>(3.435)** |                   |                    | 0.066                   | 0.560 | 11.798  |
| 5     | 1.466<br>(19.065)** |                            |                   |                     |                    | 0.001<br>(1.922)  |                    | 0.017                   | 0.574 | 3.694   |
| 6     | 1.271<br>(13.080)** |                            |                   |                     |                    |                   | 3.970<br>(3.630)** | 0.074                   | 0.557 | 13.177  |
| 7     | 0.679<br>(1.405)    | 0.743<br>(1.527)           | 0.312<br>(2.254)* |                     |                    |                   |                    | 0.033                   | 0.569 | 3.627   |
| 8     | 1.349<br>(2.633)*   | 1.693<br>(3.047)**         | 0.313<br>(2.512)* | -0.024<br>(3.240)** |                    |                   |                    | 0.090                   | 0.552 | 6.068   |
| 9     | 1.045<br>(2.047*)   | 1.424<br>(2.588)*          | 0.323<br>(2.654)* | -0.019<br>(2.594)*  | 1.002<br>(2.920)** |                   |                    | 0.134                   | 0.539 | 6.911   |
| 10    | 0.982<br>(1.907)*   | 1.428<br>(2.595)*          | 0.314<br>(2.784)* | -0.018<br>(2.940)** | 1.003<br>(2.744)** | -0.001<br>(0.963) |                    | 0.133                   | 0.539 | 5.711   |
| 11    | 0.379<br>(0.685)    | 2.217<br>(3.602)**         | 0.211<br>(2.250)* | -0.021<br>(2.935)** | 1.019<br>(2.241)*  | 0.000<br>(0.351)  | 2.769<br>(2.659)** | 0.168                   | 0.528 | 6.133   |

**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 current ratio are positive with return on assets. It indicates that the current ratio has a positive impact on return on assets. This finding is similar to the findings of Renato (2010). Similarly, the beta coefficients for cash reserve ratio are positive with return on assets. It indicates that cash reserve ratio has a positive impact on return on assets. This finding is consistent with the findings of Ajanthan (2013). Likewise, the beta coefficients for loan to assets ratio are negative with return on assets. It indicates that loan to assets ratio has a negative impact on return on assets. This finding is similar to the findings of Isik and Belke (2017). Similarly, the beta coefficients for total assets are positive with return on assets. It indicates that total assets have positive impact on return on assets. This finding is consistent with the findings of Alkassim (2005). Furthermore, the beta coefficients for number of branches are positive with return on assets. It indicates that number of branches have positive impact on return on assets. This finding is similar to the findings of Berger et al. (1997).

The regression results of current ratio, cash reserve ratio, loan to assets ratio, total assets, number of branches and total deposits with net interest margin of Nepalese commercial banks have been presented in Table 5.

**Table 5:** Estimated regression results of current ratio, cash reserve ratio, loan to assets ratio, total assets, number of branches and total deposits with net interest margin

The results are based on panel data of 22 commercial banks with 154 observations for the period of 2013/14-2019/20 by using the linear regression model and the model is  $NIMit = \beta_0 + \beta_1 CRit + \beta_2 CRRit + \beta_3 LTARit + \beta_4 TAIT + \beta_5 NOBit + \beta_6 TDit + \epsilon it$  where, the dependent variables are ROA (Return on assets as measured by net profit to total assets, 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 CR (Current ratio as measured by current assets to current liabilities, in times), CRR (Cash reserve ratio as measured by reserve requirement to bank deposits, in percentage), LTAR (Loan to assets ratio as measured by total loan outstanding to total assets, in percentage), TA (Total assets as measured by total assets of bank, Rs in billion), NOB (Number of banks, in numbers) and TD (Total deposit as measured by total deposit of a bank, Rs in million).

| Model | Intercept           | Regression coefficients of |                  |                    |                   |                    |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|------------------|--------------------|-------------------|--------------------|-------------------|-------------------------|-------|---------|
|       |                     | CR                         | CRR              | LTAR               | TA                | NOB                | TD                |                         |       |         |
| 1     | 2.778<br>(4.864)**  | 0.474<br>(0.809)           |                  |                    |                   |                    |                   | 0.002                   | 0.685 | 0.655   |
| 2     | 3.086<br>(27.572)** |                            | 0.010<br>(1.564) |                    |                   |                    |                   | 0.009                   | 0.681 | 2.445   |
| 3     | 3.820<br>(7.279)**  |                            |                  | -0.009<br>(1.115)  |                   |                    |                   | 0.002                   | 0.684 | 1.243   |
| 4     | 2.972<br>(26.247)** |                            |                  |                    | 0.003<br>(2.675)* |                    |                   | 0.039                   | 0.671 | 7.153   |
| 5     | 2.870<br>(34.142)** |                            |                  |                    |                   | 0.004<br>(5.477)** |                   | 0.159                   | 0.628 | 30.002  |
| 6     | 2.973<br>(25.350)** |                            |                  |                    |                   |                    | 3.369<br>(2.552)* | 0.035                   | 0.673 | 6.514   |
| 7     | 2.603<br>(4.496)**  | 0.495<br>(0.850)           | 0.010<br>(1.581) |                    |                   |                    |                   | 0.008                   | 0.682 | 1.581   |
| 8     | 3.093<br>(4.931)**  | 1.190<br>(1.749)           | 0.010<br>(1.708) | -0.017<br>(1.934)* |                   |                    |                   | 0.025                   | 0.676 | 2.319   |
| 9     | 2.791<br>(4.421)**  | 0.922<br>(1.356)           | 0.011<br>(1.798) | -0.013<br>(1.397)  | 0.002<br>(2.343)* |                    |                   | 0.054                   | 0.666 | 3.164   |
| 10    | 3.153<br>(5.304)**  | 0.897<br>(1.412)           | 0.006<br>(1.037) | -0.016<br>(1.944)* | 0.002<br>(1.608)  | 0.006<br>(4.777)** |                   | 0.174                   | 0.622 | 7.466   |
| 11    | 3.058<br>(4.678)**  | 1.022<br>(1.406)           | 0.006<br>(0.941) | -0.017<br>(1.971)* | 0.006<br>(0.578)  | 0.006<br>(4.719)** | 4.392<br>(0.357)  | 0.170                   | 0.624 | 6.207   |

**Notes:**

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

Table 5 shows that the beta coefficients for current ratio are positive with net interest margin. It indicates that the current ratio has a positive impact on net interest margin. This finding is similar to the findings of Maqsood et al. (2016). Similarly, the beta coefficients for cash reserve ratio are positive with net interest

margin. It indicates that cash reserve ratio has a positive impact on net interest margin. This finding is consistent with the findings of Chronopoulos et al. (2015). Likewise, the beta coefficients loan to assets ratio are negative with net interest margin. It indicates that loan to assets ratio has a negative impact on net interest margin. This finding is similar to the findings of Roman and Danuletiu (2013). Similarly, the beta coefficients for total assets are positive with net interest margin. It indicates that total assets have positive impact on net interest margin. This finding is consistent with the findings of Haron (2004). However, the beta coefficients for number of branches are positive with net interest margin. It indicates that number of branches have positive impact on net interest margin. This finding is similar to the findings of Soteriou and Zenios (1997).

## 4. Summary and conclusion

The banking sector is the most growing and influential industry in the developing economy. In most cases, the banking industry defines the development aspect of an economy. Liquidity and bank size are lifeblood of a banking system to gear banks towards a financial position that enables them meet their financial obligations.

This study attempts to analyze the impact on liquidity and bank size on the profitability of Nepalese commercial banks. The study is based on secondary data of 22 commercial banks with 154 observations for the period from 2013/14 to 2019/20.

The study showed that current ratio, cash reserve ratio, total assets, number of branches and total deposits have positive impact on return on assets of Nepalese commercial banks. However, loan to assets ratio has a negative impact on return on assets. Similarly, loan to assets ratio has a negative impact on return on equity. In addition, current ratio, cash reserve ratio, total assets, number of branches and total deposits have positive impact on net interest margin. The study concluded that number of branches followed by total deposit is the most influencing factor that explains the changes in the profitability in terms of net interest margin of Nepalese commercial banks. The study also concluded that total deposits followed by total asset is the most influencing factor that explains the changes in the profitability in terms of return on assets in Nepalese commercial banks.

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## Abstract

*This study examines the effect of bank-specific, industry-specific and macroeconomic variables on the profitability of Nepalese commercial banks. Return on assets and return on equity are selected as the dependent variables. Similarly, capital adequacy ratio, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 128 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics and Bank Supervision Report 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 bank-specific, industry-specific and macroeconomic variables on the profitability of Nepalese commercial banks.*

*The study showed that capital adequacy ratio has a positive impact on return on assets. It means that increase in capital adequacy ratio leads to increase in return on assets. Moreover, loan loss provision has a negative impact on return on equity. It means that increase in loan loss provision leads to decrease in return on equity. Furthermore, liquidity has a negative impact on return on equity. It shows that an increase in liquidity leads to a decrease in return on equity. However, liquidity has a negative impact on return on assets. It shows that an increase in liquidity leads to a decrease in return on assets. Moreover, bank size has a positive impact on return on assets. It indicates that increase in bank size leads to increase in return on assets. In addition, the study showed that gross domestic product has a positive impact on return on assets. It means that an increase in gross domestic product leads to increase in return on assets in Nepalese commercial banks. The result also showed that inflation has a negative impact on return on assets. It indicates that an increase in inflation leads to decrease in return on assets.*

**Key words:** Return on assets, return on equity, capital adequacy, loan loss provision, liquidity, bank size, ownership, gross domestic product, inflation.

# 1. Introduction

The banking sector plays an important role in the expansion of the financial system and economic development of any country. According to Alam et al. (2011), banking sector plays the significant role in overall development of the economy in all countries. Banks are the most important financial intermediaries in the most economies, which provides a bundle of different services. Harrington (2005) stated that profitability is one of the most important objectives of financial management because one goal of financial management is to maximize the owner's wealth. According to Ali et al. (2011), the profitability of the banking sector of any country is important because the financial system of a country is largely based on banking system. According to Athanasoglou et al. (2008), a strong and productive banking sector can better resist negative shocks and contribute to financial system stability. Thus, financial institution is considered as a key factor for the economic growth of the nation. Bank profitability tends to go hand-in-hand with economic activity. Slower growth prospects may dent bank profitability through a reduction in the lending activity and a possible increase in credit impairments (Jreisat and Bawazir, 2021).

Horobet et al. (2021) investigated the determinants of banking profitability in the CEE banking sectors based on a Generalized Method of Moments (GMM) approach using data between 2009 and 2018. The study found that unemployment rate, inflation, budget balance, non-governmental credit, non-performing loan rates, concentration rate and capitalization rate have negative impact on the banking profitability in the CEE banking sectors. Mathuva (2009) examined the relationship between capital adequacy, cost income ratio and profitability of Kenya for the period 1998 to 2007. The study revealed that equity capital ratio and cost income ratio are negatively related to bank profitability. However, Olalekan and Adeyinka (2013) examined the effect of capital adequacy on profitability of deposit taking of both foreign and domestic banks in Nigerian banking sector. The study observed positive and significant relationship between capital adequacy and profitability. Datta and Al Mahmud (2018) examined the impact of capital adequacy on profitability of listed commercial banks operating in Bangladesh under Basel II accord. The study observed that the capital adequacy ratio has positive effect on the profitability measures of banks. Boyd and Champ (2006) stated that one way inflation might affect economic growth through the banking sector is by reducing the overall amount of credit that is available to businesses. Anbar and Alper (2011) found that inflation has no significant impact on bank profitability. Sufian and Chong (2008) examined the determinants of profitability of Philippines banks. The study revealed that credit risk measured by loan loss provision/ total loans has negative impact on profitability. Similarly, Kolapo et al. (2012) analysed the quantitative effect of credit risk on the performance of commercial banks in Nigeria. The study observed that there is negative relationship between loan loss provision and performance. UI Mustafa et al. (2012) examined the impact of loan loss provisions of the banks on the performance of the banks operating in Pakistan. The study stated that that lower the loan loss provision, higher would be the profitability.

Jreisat and Bawazir (2021) found that commission and credit card fee positively influence the financial performance of banks and significantly contributed to the profitability of banks. Similarly, higher gross domestic product (GDP) led to higher profitability for banks across the MENA region. Nonetheless, a negative link was established between bank profitability and credit risk. Lartey et al. (2013) examined the relationship between the liquidity and the profitability of banks listed on the Ghana Stock Exchange. The study revealed that there is positive relationship between the liquidity and the profitability of the listed banks. Vintila and Nenu (2016) investigated the relationship between liquidity and corporate financial performance. The study observed negative correlation between liquidity and corporate financial performance. However, Madushanka and Jathurika (2018) investigated the relationship between liquidity

and profitability of listed manufacturing companies in Sri Lanka. The study revealed that liquidity has positive and significant impact on the profitability. Fanta et al. (2013) examined the corporate governance mechanisms and their impact on performance of commercial banks. The study observed the size of the bank is an important factor with a positive contribution to its profitability. However, Almazari (2014) investigated the internal factors that affect profitability of banks of the Saudi and Jordanian banks. The study revealed negative relationship between bank size and profitability. Similarly, Tran and Phan (2020) examined the relationship between bank size, credit risk and profitability of Vietnam's commercial banks during the period from 2009 to 2018. The study observed that there is negative relationship between bank size and profitability.

Van-Thep and Day-Yang (2020) examined the factors influencing Vietnamese commercial banks' profitability. The study concluded that bank ownership and inflation have negative and significant relationship with profitability. Likewise, Dietrich and Wanzenried (2014) analysed how bank-specific characteristics, macroeconomic variables and industry-specific factors affect the profitability. The study observed that privately owned banks are more profitable than state-owned banks in the low-income and middle-income categories. Moreover, Rosalina and Nugraha (2019) examined the effects of ownership structure on the profitability of banks in Indonesia over the period of 2013- 2017. The study revealed that private domestic and foreign ownership have statistically significant positive effects on bank profitability. According to Noman et al. (2015), capital adequacy encourages the strength of the bank and improves the solvency of the bank as it acts as a cushion to absorb the unexpected expenditure/losses incurred by the banks. A bank with a high capital adequacy ratio is generally considered to be safe and capable of meeting its financial obligations (Dabo et al., 2018). Capraru and Ihnatov (2014) showed that profitability of a bank is positively related to the capital adequacy ratio. Anandarajan et al. (2003) examined the role of loan loss provisions in earnings management, capital management, and signaling. The study revealed that Spanish commercial banks use loan loss provisions to manage reported earnings but not to manage regulatory capital. Furthermore, Wahlen (1994) found strong evidence that banks use loan-loss provisions to smooth profits.

Batsinda and Shukla (2019) evaluated the impact of inflation on the profitability of commercial banks in Rwanda with specific focus on the Bank of Kigali. The study revealed that inflation has positive impact on the profitability of commercial banks. Wasiuzzaman and Tarmizi (2010) examined the impact of bank characteristics as well as macroeconomic determinants on the profitability of Islamic banking profitability in Malaysia. The study revealed that gross domestic product is positively related to bank profitability. Similarly, Saeed (2014) investigated the impact of bank-specific, industry-specific, and macroeconomic variables on bank profitability before, during, and after the financial crisis of 2008. The study revealed that gross domestic product has negative impact on profitability. In addition, Duraj and Moci (2015) investigated the determinants of the profitability over the period of 1999- 2014. The study observed a positive and significant relationship between GDP and profitability. Vong and Chan (2009) examined the impact of bank characteristics as well as macroeconomic and financial structure variables on the performance of the Macao banking industry. The study revealed that inflation has positive and significant relationship with firm performance. Hooshyari and Moghanloo (2015) examined the impact of inflation on profitability of banks over the period of 2010- 2013. The study showed that there is strong correlation between inflation and profitability.

In the context of Nepal, Pradhan and Dahal (2021) examined the financial performance of Nepalese insurance companies. The study showed that firm size has positive impact on return on assets and earning

per share. It indicates that increase in firm size leads to increase return on assets and earnings per share. Similarly, current ratio has negative impact on return on assets. It means that increase in current ratio leads to decrease in return on assets. Khanal (2016) examined the effect of bank specific and macroeconomic factors on the profitability of Nepalese commercial banks for the period of 2007/08-2013/14. The study observed that equity to total assets, loan loss provision to total loan, GDP growth rate and inflation are positively correlated to return on assets and return on equity. Marahatta et al. (2016) examined determinants of bank's performance in Nepalese commercial banks for the period of 2008-2014. The study observed that assets quality, bank size, GDP growth and liquidity have positive relationship with return on assets. The study also revealed that there is negative relationship between capital adequacy and return on assets and GDP growth rate and inflation have positive impact on return on equity. Likewise, Gwachha (2019) examined the bank-specific and macroeconomic determinants of the profitability in the Nepalese banking sector over the period from 2004 to 2013. The study observed that bank size has a positive and significant effect on profitability while loans to assets ratio has negative and significant impact on the bank profitability. In addition, Budhathoki and Rai (2020) examined the impact of assets quality, capital adequacy ratio, assets diversification and operating efficiency on banks' profitability. The study stated that provision for the loan loss ratio has negative relationship with profitability. The study also revealed capital adequacy is negatively related to return on assets.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of bank-specific, industry-specific and macroeconomic determinants on the 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 examine the effect of bank-specific, industry-specific and macroeconomic determinants on the profitability of the Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation 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 sections draws the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 16 commercial banks out of 27 commercial banks on the basis of total assets for the study period from 2013/14 to 2020/21, leading to a total of 128 observations. The study employed stratified sampling method. The main sources of data include Banking and Financial Statistics and Bank Supervision Report published by Nepal Rastra Bank 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 banks selected for the study along with the study period and number of observations

| S. N.                               | Name of the banks                      | Study period      | Observations |
|-------------------------------------|----------------------------------------|-------------------|--------------|
| <b>Public Banks</b>                 |                                        |                   |              |
| 1                                   | Agricultural Development Bank Limited  | 2013/14 - 2020/21 | 8            |
| 2                                   | Nepal Bank Limited                     | 2013/14 - 2020/21 | 8            |
| <b>Joint Venture Banks</b>          |                                        |                   |              |
| 3                                   | Standard Chartered Bank Nepal Limited  | 2013/14 - 2020/21 | 8            |
| 4                                   | Nepal SBI Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 5                                   | Himalayan Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 6                                   | Everest Bank Limited                   | 2013/14 - 2020/21 | 8            |
| <b>Private Banks</b>                |                                        |                   |              |
| 7                                   | Civil Bank Limited                     | 2013/14 - 2020/21 | 8            |
| 8                                   | Century Commercial Bank Limited        | 2013/14 - 2020/21 | 8            |
| 9                                   | Bank of Kathmandu Limited              | 2013/14 - 2020/21 | 8            |
| 10                                  | Nepal Credit and Commerce Bank Limited | 2013/14 - 2020/21 | 8            |
| 11                                  | Sunrise Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 12                                  | Laxmi Bank Limited                     | 2013/14 - 2020/21 | 8            |
| 13                                  | Machhapuchchhre Bank Limited           | 2013/14 - 2020/21 | 8            |
| 14                                  | Sanima Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 15                                  | Citizens Bank International Limited    | 2013/14 - 2020/21 | 8            |
| 16                                  | Mega Bank Nepal Limited                | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                        |                   | <b>128</b>   |

Thus, the study is based on the 128 observations.

## The model

The model used in this study assumes that the bank's profitability depends upon bank- specific, industry-specific, macro-economic factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are capital adequacy ratio, loan loss provision, liquidity, bank size, ownership, GDP and inflation. Therefore, the model takes the following form:

Bank profitability = f (capital adequacy, loan loss provision, liquidity, bank size, ownership, GDP and inflation)

More specifically,

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 LLP_{it} + \beta_3 LIQ_{it} + \beta_4 BS_{it} + \beta_5 OWN_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + e_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 LLP_{it} + \beta_3 LIQ_{it} + \beta_4 BS_{it} + \beta_5 OWN_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + e_{it}$$

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.

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

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



|     |   |                                                                                                                           |
|-----|---|---------------------------------------------------------------------------------------------------------------------------|
| LIQ | = | Liquidity as measured by the ratio of total loans to total deposits, in percentage.                                       |
| BS  | = | Bank size as measured by the total assets, Rs in billion.                                                                 |
| OWN | = | Ownership as measured by dummy variable, 1 for privately owned banks, 0 for otherwise.                                    |
| GDP | = | Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion. |
| INF | = | Inflation rate as measured by the change in consumer price index, in percentage.                                          |

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

## Capital adequacy ratio

Capital adequacy is a regulated amount of the capital base used by the banking industries to effectively perform the primary function by preventing failure through absorbing losses. Ogboi and Unuafé (2013) revealed that there is a positive and significant relationship between capital adequacy and financial performance measured by return on assets. Similarly, Vyas et al. (2008) revealed that capital adequacy ratio is positively related to profitability of commercial banks. Likewise, Ebenezer et al. (2017) stated that capital adequacy ratio has a positive and significant effect on bank profitability. Likewise, Kusumastuti and Alam (2019) stated that capital adequacy ratio has a positive effect on profitability. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between capital adequacy ratio and profitability.

## Loan loss provision

Beatty and Lioa (2009) defined loan loss provision as a policy that followed by commercial banks by putting some money aside (reserves) to face any potential loans default, which in turn would help to protect banks' positions in terms of profitability and capital. Ramlall (2009) revealed that loan loss provision has a negative and significant relationship with profitability. Similarly, Sufian and Habibullah (2009) also found that loan loss provision and profitability are negatively related. Likewise, Alhadab and Alsahawneh (2016) also stated that loan loss provision has a negative relationship with profitability. However, Rishitharan et al. (2021) stated a positive relationship between the loan loss provision and ROA. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a negative relationship between loan loss provision and profitability.

## Liquidity

Liquidity is defined as a bank's ability to meet all its debt obligations and be able to fulfil credit requests submitted without delay. Malik et al. (2016) revealed that there is positive relationship between the profitability and liquidity ratio. Likewise, Chou and Buchdadi (2016) stated that liquidity has a positive and significant effect on return on assets. Similarly, Sur et al. (2001) revealed there is a positive relationship between liquidity and profitability. Olagunju et al. (2012) observed that liquidity has a positive influence on profitability of a commercial banks. In contrary, Francis (2013) found that liquidity is significantly and negatively related to profitability. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between liquidity and profitability.



## Bank size

Bank size is measured in terms of total assets. Kawshala and Panditharathna (2017) stated that there is a positive relationship between bank size and bank profitability. Similarly, Vijayakumar and Tamizhselvan (2010) revealed that there is positive relationship assets size and profitability. Likewise, Ally (2014) analyzed the determinants of banks' profitability in a developing economy like Tanzania. The study stated that there is positive association between bank size and profitability. In addition, Gyamerah and Amoah (2015) examined the determinants of bank profitability in Ghana. The study concluded that bank size has a positive relationship with profitability. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between bank size and profitability.

## Ownership

Ownership status is mainly concerned to determine whether the bank is publicly or privately owned. Huang (2020) concluded that ownership concentration has positive relationship with profitability. Haslem (1968) stated a positive relationship between government ownership and return on equity. Likewise, Chen (2012) stated private ownership has a positive effect on firm profitability and growth and negative effect on firm valuation and risk. However, Shahid and Haq (2013) found that government ownership is positively associated to risk and negatively related to bank profitability. Rosalina and Nugraha (2019) indicated that private domestic ownership has a positive and significant effect on bank profitability. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between ownership and profitability.

## Gross domestic product

Gross domestic product (GDP) is the value of goods and services produced in that country in a specific year. Tan and Floros (2012) observed that higher GDP growth leads to higher bank profitability. Similarly, Noor and Hayati (2012) examined the relationship between Islamic banking profitability and determinants of efficiency. The study revealed that GDP has positive impact on Islamic banks efficiency. Additionally, Tanna et al. (2008) analyzed the determinants of profitability of domestic UK commercial banks. The study found a significant and positive relationship between bank profitability and GDP. Similarly, Sharma and Mani (2012) assessed the impact of macroeconomic and financial market indicators on the banking sector of India. The study found that GDP is positively related to ROA and ROE. Furthermore, Kanwal and Nadeem (2013) examined the impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan. The study observed that real GDP has an insignificant positive effect on ROA. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between GDP and profitability.

## Inflation

Inflation is a rise in the general price of goods and services that causes the buying power of people to decrease so that the cost-of-living increases. Batsinda and Shukla (2019) stated that inflation has a positive relationship with profitability. In addition, Islam and Nishiyama (2016) examined the determinants of bank profitability using dynamic panel evidence from South Asian countries. The study revealed that inflation positively affect bank profitability. Moreover, Azmi et al. (2022) found that inflation has a

significant positive effect on the profitability measured by ROA. Likewise, Muraina (2018) stated that inflation is positively related to profitability. However, Kanwal and Nadeem (2013) assessed the effect of macroeconomic variables on the profitability of listed commercial banks in Pakistan. The study stated inflation rate has negative impact on profitability. Based on it, this study develops the following hypothesis:

H<sub>7</sub>: There is a positive relationship between inflation and profitability.

## 3. Results and discussion

### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period of 2013/14 to 2020/21. 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), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage), LIQ (Liquidity as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by the total assets, Rs in billion), OWN (Ownership as measured by dummy variable, 1 for privately owned banks, 0 otherwise), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage).

| Variables | Minimum | Maximum | Mean  | S.D.  |
|-----------|---------|---------|-------|-------|
| ROA       | 0.01    | 3.12    | 1.50  | 0.59  |
| ROE       | 3.91    | 28.65   | 13.95 | 4.64  |
| CAR       | 4.55    | 22.99   | 14.02 | 2.71  |
| LLP       | 0.20    | 8.46    | 1.98  | 1.30  |
| LIQ       | 56.47   | 103.38  | 84.72 | 9.37  |
| BS        | 20.57   | 222.64  | 93.42 | 47.10 |
| OWN       | 0.00    | 1.00    | 0.88  | 0.33  |
| GDP       | 20.00   | 34.27   | 28.80 | 5.67  |
| INF       | 3.60    | 9.93    | 6.15  | 2.23  |

### 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 16 Nepalese commercial banks for the study period of 2013/14 to 2020/21. 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), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage), LIQ (Liquidity as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by the total assets, Rs in billion), OWN (Ownership as measured by dummy variable, 1 for privately owned banks, 0 otherwise), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage).

| Variables | ROA      | ROE      | CAR      | LLP      | LIQ      | BS       | OWN   | GDP      | INF |
|-----------|----------|----------|----------|----------|----------|----------|-------|----------|-----|
| ROA       | 1        |          |          |          |          |          |       |          |     |
| ROE       | 0.403**  | 1        |          |          |          |          |       |          |     |
| CAR       | 0.277**  | -0.233** | 1        |          |          |          |       |          |     |
| LLP       | 0.054    | -0.181*  | 0.007    | 1        |          |          |       |          |     |
| LIQ       | -0.220*  | -0.340** | 0.177*   | -0.024   | 1        |          |       |          |     |
| BS        | 0.189*   | -0.016   | 0.245**  | 0.050    | 0.157    | 1        |       |          |     |
| OWN       | -0.307** | 0.075    | -0.184*  | -0.638** | 0.060    | -0.383** | 1     |          |     |
| GDP       | 0.067    | -0.250** | 0.413**  | -0.248** | 0.464**  | 0.701**  | 0.000 | 1        |     |
| INF       | -0.030   | 0.233**  | -0.394** | 0.182*   | -0.398** | -0.535** | 0.000 | -0.802** | 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 is positively correlated to return on assets. It means that increase in capital adequacy ratio leads to increase in return on assets. However, there is a positive relationship between loan loss provision and return on assets. It means that increase in loan loss provision leads to increase in return on assets. Similarly, liquidity has a negative relationship with return on assets. It shows that an increase in liquidity leads to a decrease in return on assets. Moreover, there is a positive relationship between bank size and return on assets. It indicates that increase in bank size leads to increase in return on assets. In contrast, ownership has a negative relationship with return on assets. It indicates increase in proportion of private ownership leads to decrease in return on assets. In addition, the study shows that there is a positive relationship between gross domestic product and return on assets. It means that an increase in gross domestic product leads to increase in return on assets in Nepalese commercial banks. The result also shows that inflation has negative relationship with return on assets. It indicates that an increase in inflation leads to decrease in return on assets.

Similarly, the result also shows that capital adequacy ratio is negatively correlated to return on equity. It means that increase in capital adequacy ratio leads to decrease in return on equity. Moreover, 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. Furthermore, liquidity has a negative relationship with return on equity. It shows that an increase in liquidity leads to a decrease in return on equity. Likewise, 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, ownership has a positive relationship with return on equity. It indicates increase in proportion of private ownership leads to increase in return on equity. However, this study shows that there is a negative relationship between gross domestic product and return on equity. It means that an increase in gross domestic product leads to decrease in return on equity. The result also shows that inflation has negative relationship with return on equity. It indicates that increase in inflation 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, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation on return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of capital adequacy, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation on return on assets

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $ROA_i = \beta_0 + \beta_1 CAR_i + \beta_2 LLP_i + \beta_3 LIQ_i + \beta_4 BS_i + \beta_5 OWN_i + \beta_6 GDP_i + \beta_7 INF_i + \epsilon_i$  where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage), LIQ (Liquidity as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by the total assets, Rs in billion), OWN (Ownership as measured by dummy variable, 1 for privately owned banks, 0 otherwise), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage).

| Model | Inter-cept          | Regression coefficients of |                  |                     |                    |                     |                    |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|------------------|---------------------|--------------------|---------------------|--------------------|-------------------|-------------------------|-------|---------|
|       |                     | CAR                        | LLP              | LIQ                 | BS                 | OWN                 | GDP                | INF               |                         |       |         |
| 1     | 0.650<br>(2.424)*   | 0.061<br>(3.241)**         |                  |                     |                    |                     |                    |                   | 0.070                   | 0.574 | 10.505  |
| 2     | 1.454<br>(15.067)** |                            | 0.025<br>(0.607) |                     |                    |                     |                    |                   | 0.005                   | 0.596 | 0.369   |
| 3     | 2.687<br>(5.714)**  |                            |                  | -0.014<br>(2.534)*  |                    |                     |                    |                   | 0.041                   | 0.582 | 6.420   |
| 4     | 1.280<br>(11.084)** |                            |                  |                     | 0.002<br>(2.161)*  |                     |                    |                   | 0.028                   | 0.586 | 4.672   |
| 5     | 1.984<br>(13.970)** |                            |                  |                     |                    | -0.550<br>(3.623)** |                    |                   | 0.087                   | 0.568 | 13.127  |
| 6     | 1.299<br>(4.745)**  |                            |                  |                     |                    |                     | 0.007<br>(0.757)   |                   | 0.003                   | 0.596 | 0.573   |
| 7     | 1.553<br>(10.001)** |                            |                  |                     |                    |                     |                    | -0.008<br>(0.341) | 0.007                   | 0.597 | 0.116   |
| 8     | 1.001<br>(2.401)*   | 0.057<br>(2.801)**         |                  |                     |                    | -0.465<br>(3.073)** |                    | -0.019<br>(0.788) | 0.129                   | 0.555 | 7.244   |
| 9     | 2.790<br>(5.271)**  | 0.056<br>(3.078)**         | 0.085<br>(1.784) | -0.016<br>(3.064)** |                    | -0.652<br>(3.419)** |                    |                   | 0.202                   | 0.531 | 9.047   |
| 10    | 2.530<br>(3.396)**  | 0.057<br>(2.943)**         | 0.081<br>(1.608) | -0.015<br>(2.775)** | 0.001<br>(0.649)   | -0.591<br>(2.735)** |                    | -0.012<br>(0.405) | 0.192                   | 0.535 | 6.026   |
| 11    | 2.384<br>(2.956)**  | 0.055<br>(2.702)**         | 0.075<br>(1.467) | -0.017<br>(2.729)** | 0.068<br>(3.600)** | -0.001<br>(0.639)   | 0.381<br>(4.611)** | -0.002<br>(1.380) | 0.187                   | 0.536 | 5.165   |

### 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 Ogboi and Unuafé (2013). The beta coefficients for loan loss provision are negative with return on assets. It indicates that loan loss provision has a positive impact on return on assets. This finding is not consistent to the findings of Rishitharan et al. (2021). Similarly, 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 similar to the findings of Francis (2013). Likewise, 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 Kawshala and Panditharathna (2017). Similarly, the beta coefficients for gross domestic product are positive with return on assets. It indicates that gross domestic product has a positive impact on return on assets. This finding is consistent with the findings of Tan and Floros (2012). In addition, the beta coefficients of 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 Kanwal and Nadeem (2013).

Table 5 shows the estimated regression results of capital adequacy, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation on return on equity of Nepalese commercial banks.

**Table 5:** Estimated regression results of capital adequacy, loan loss provision, liquidity, bank size, ownership, gross domestic product and inflation on return on equity

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $ROE_i = \beta_0 + \beta_1 CAR_i + \beta_2 LLP_i + \beta_3 LIQ_i + \beta_4 BS_i + \beta_5 OWN_i + \beta_6 GDP_i + \beta_7 INF_i + e_i$  where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage), LIQ (Liquidity as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by the total assets, Rs in billion), OWN (Ownership as measured by dummy variable, 1 for privately owned banks, 0 otherwise), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage).

| Model | Inter-cept           | Regression coefficients of |                     |                     |                     |                  |                     |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|----------------------|----------------------------|---------------------|---------------------|---------------------|------------------|---------------------|--------------------|-------------------------|-------|---------|
|       |                      | CAR                        | LLP                 | LIQ                 | BS                  | OWN              | GDP                 | INF                |                         |       |         |
| 1     | 19.539<br>(9.236)**  | -0.398<br>(2.689)**        |                     |                     |                     |                  |                     |                    | 0.047                   | 4.527 | 7.230   |
| 2     | 15.233<br>(20.555)** |                            | -0.645<br>(2.061)*  |                     |                     |                  |                     |                    | 0.025                   | 4.578 | 4.246   |
| 3     | 28.214<br>(7.980)**  |                            |                     | -0.168<br>(4.058)** |                     |                  |                     |                    | 0.109                   | 4.378 | 16.465  |
| 4     | 14.097<br>(15.377)** |                            |                     |                     | -0.002<br>(0.174)   |                  |                     |                    | 0.008                   | 4.654 | 0.030   |
| 5     | 13.043<br>(11.239)** |                            |                     |                     |                     | 1.041<br>(0.839) |                     |                    | 0.002                   | 4.642 | 0.704   |
| 6     | 19.851<br>(9.580)**  |                            |                     |                     |                     |                  | -0.205<br>(2.900)** |                    | 0.055                   | 4.507 | 8.409   |
| 7     | 10.975<br>(9.319)**  |                            |                     |                     |                     |                  |                     | 0.485<br>(2.689)** | 0.047                   | 4.527 | 7.231   |
| 8     | 29.739<br>(8.399)**  |                            | -0.674<br>(2.290)*  | -0.171<br>(4.179)** |                     |                  |                     |                    | 0.138                   | 4.305 | 11.132  |
| 9     | 32.637<br>(8.711)**  | -0.301<br>(2.133)*         | -0.667<br>(2.297)*  | -0.155<br>(3.792)** |                     |                  |                     |                    | 0.161                   | 4.246 | 9.148   |
| 10    | 32.680<br>(8.741)**  | -0.226<br>(1.472)          | -0.777<br>(2.562)** | -0.130<br>(2.849)** |                     |                  | -0.104<br>(1.231)   |                    | 0.165                   | 4.237 | 7.269   |
| 11    | 35.149<br>(8.298)**  | -0.256<br>(1.650)          | -1.108<br>(2.737)** | -0.120<br>(2.585)** |                     | 1.905<br>(1.231) | -0.125<br>(1.451)   |                    | 0.168                   | 4.228 | 6.142   |
| 12    | 32.988<br>(7.898)**  | -0.156<br>(1.007)          | -1.115<br>(2.839)** | -0.082<br>(1.752)   | -0.041<br>(2.919)** | 0.332<br>(0.197) | -0.407<br>(3.185)** |                    | 0.217                   | 4.103 | 6.854   |
| 13    | 32.392<br>(5.228)**  | -0.153<br>(0.983)          | -1.113<br>(2.822)** | -0.082<br>(1.741)   | -0.040<br>(2.899)** | 0.335<br>(0.198) | -0.396<br>(2.550)*  | 0.036<br>(0.131)   | 0.210                   | 4.121 | 5.830   |

**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 Ebenezer et al. (2017). The beta coefficients for loan loss provision are negative with return

on equity. It indicates that loan loss provision has a negative impact on return on equity. This finding is consistent to the findings of Alhadab and Alsahawneh (2016). Similarly, 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 similar to the findings of Francis (2013). Similarly, 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 consistent with the findings of Kanwal and Nadeem (2013). In addition, the beta coefficients of inflation are positive with return on equity. It indicates that inflation has a positive impact on return on equity. This finding is consistent with the findings of Batsinda and Shukla (2019).

## 4. Summary and conclusion

Banking sector plays an effective role in the economic development in all the countries and especially commercial banks which plays a vital role in a country's economic resource allocation. Bank are the financial intermediaries that plays great role in channeling the savings into productive activities for the growth of the economy. Profitability is one of the major targets of any business sector as it boosts the economic growth of the country. There are several internal and external factors that affects the profitability of commercial banks. The bank- specific, industry- specific and macroeconomic determinants plays a vital role in determining the bank profitability.

This study attempts to examine the effect of bank-specific, industry-specific and macroeconomic determinants on the profitability of the Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study showed that capital adequacy ratio, loan loss provision, bank size and gross domestic product have positive impact on return on assets. However, liquidity, ownership and inflation have negative impact on return on assets. Likewise, the study also showed that capital adequacy ratio, loan loss provision, liquidity, bank size and gross domestic product have negative impact on return on equity. However, ownership and inflation have positive impact on return on equity. The study concluded that ownership followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on asset of Nepalese commercial banks. Similarly, the study also concluded that liquidity followed by inflation is the most influencing factor that explains the changes in return on equity in context of Nepalese commercial banks.

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PART IV

# Financial Institutions & Markets



## Abstract

*This study examines the impact of credit portfolio management on the profitability of Nepalese commercial banks. Return on assets and net profit margin are the dependent variables. The independent variables are agriculture loan, real estate loan, term loan, corporate sector loan, government securities and term loan. The study is based on secondary data of 27 commercial banks with 135 observations for the period from 2016/17 to 2020/21. The data are collected from the Banking and Financial Statistics and Central Bureau of Statistics of Nepal published by Nepal Rastra Bank and annual reports of the commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of credit portfolio management on the profitability of Nepalese commercial banks.*

*The study showed that agriculture loan has a positive impact on return on assets. It indicates that increase in agriculture loan leads to increase in return on assets. On the other hand, the results showed that agriculture loan has a negative impact on net profit margin. It indicates that increase in agriculture loan leads to decrease in net profit margin. Similarly, real estate loan has a positive impact on return on assets and net profit margin. It reveals that higher the real estate loan, higher would be the return on assets and net profit margin. In addition, the study showed that term loan has a negative impact on return on assets and net profit margin. It indicates that increase in term loan leads to decrease in return on assets and net profit margin. Moreover, corporate sector loan has a positive impact on return on assets and net profit margin. It reveals that higher the corporate sector loan, higher would be the return on assets and net profit margin. Furthermore, government securities have a positive impact on return on assets and net profit margin. It indicates that increase in government securities leads to increase in return on assets and net profit margin.*

**Key words:** Agriculture loan, real estate loan, term loan, corporate sector loan, government securities and term loan.

# 1. Introduction

The banking sector in any economy serves as a catalyst for growth and development. Banks are able to perform this role through their crucial functions of financial intermediation, provision of an efficient payment system and facilitating the implementation of monetary policies. Bank profitability is usually expressed as a function of internal and external determinants (Gongera et al., 2013). In today's economic environment, achieving improved performance and efficiency in public and private sector banking institutions has been prioritized more than ever before. Banking organizations aim at achieving these with the objective of improving competitiveness, delivering better service, and reducing costs. To achieve milestones in profitability increments, commercial banks should understand and address the determinants of their profitability. Only when these determinants are understood, can organizations be able to tackle the matter of profits improvement (Goddard, 2004). Diversifying credit portfolios influenced the risk level of banks with losses in one sector or one location being compensated from the gains obtained from the other sectors or locations (Hailu and Tassew, 2018). Credit portfolio management deals with the evaluation of each portfolio at periodic intervals to judge the quality of assets held in the portfolio and protect them from losing values through appropriate corrective action in time. For managing the credit portfolio, banks may divide its total credit assets into different portfolios or sub portfolios (Hamidovich, 2016).

Sound loan portfolio management is a prerequisite for financial institutions' stability and continuing profitability. Diamond (1984) suggested that diversification should be a way to reduce the risk within a portfolio of assets given asymmetric information in banking market. The bank credit should be as diversified as possible because the diversification of banks' credit portfolio is positively associated with bank profitability. Margrabe (2007) found that creating portfolios of investments and loans are focused on enhancing the financial performance and mitigating the risk of the banks. Diversification is a portfolio strategy designed to cut back risk by combining various investments. Diversification gains from shifting into non-interest income in bank's revenue and reduces volatility of bank profits (Stiroh, 2004). Raei et al. (2016) found that there is a significant relationship between loan portfolio diversification and risk among the banks listed in Tehran stock exchange. However, there is no statistically significant relationship between use of portfolio diversification strategy and bank's return on assets and return on equity. Financial institutions may have higher average revenues if the institutions use some of the gains from diversification to make higher risk investments (Hughes and Mester, 1998). Drucker and Puri (2009) found that diversified banks can gain economies of scope through spreading fixed costs over multiple products. However, Rajan et al. (2000) stated that the increase in diversification can lead resource flows towards inefficient divisions within the firm which becomes poor investments and affect firm value negatively.

The major concern of risk management in banks today is managing credit risk and for better credit risk management, loan portfolio management is crucial. The bank's credit portfolio management can be determined by its credit operation. Langrin and Roach (2009) found that greater returns or lower risk is not guaranteed by loan portfolio diversification. The study found that loan concentration may in fact be more consistent with achieving minimal systemic risk. Lins and Servaes (2002) found that firms with a more diversified asset will tend to have lower profit than firms that have not diversified their assets. However, Ishak and Napier (2006) argued that diversification of portfolio will tend to increase the firm value. Churchill and Frankiewicz (2011) stated that diversification is a portfolio tactic that is intended to reduce risk by combining various investments with great returns. Moreover, Delpachitra and Lester (2013) revealed a positive impact of diversification of banking operations on competitiveness and performance banks. In addition, Afza et al. (2004) investigated the relationship between diversification and

a firm's financial performance. The study found that the non-diversified firms performed better than the diversified firms. However, the high return of non-diversified firms is accompanied by low risk and the low return of diversified firms is riskier. Koch and Wall (2000) stated that loan portfolio management is the process by which risks that are inherent in the credit process are managed and controlled. Effective loan portfolio management begins with oversight of the risk in individual loans.

Banking operation in competitive environment is more stable as they diversify their portfolio that results in to enhanced performance and risk adjusted returns for bank (Amidu, 2013). Rossi et al. (2009) found a positive relationship between diversification and firm profits. The study also showed a negative relationship between diversification and banking costs and risks. Tabak et al. (2011) found that loan portfolio concentration increases return and reduces default risk. For managing the credit portfolio, banks may divide its total credit assets into different portfolios or sub portfolios (Isa et al., 2013). Boot and Schmeits (2000) revealed that diversified financial institutions may reduce the expected costs of financial distress or bankruptcy by lowering risks through spreading operations across different products. Loan portfolio management involves evaluating the steps which the bank management takes to identify and control risks throughout the credit process. The assessment strongly focuses on what management does to identify issues before they become problems. In recent years, more and more globally active financial institutions in the US and Europe have been proactively engaged in loan portfolio management, rebalancing their loan asset portfolios while utilizing the credit market's functions to the full (Kraft and Jankov, 2005). Likewise, Driga and Dura (2015) assessed the effect of loan portfolio quality on the performance of banks. The findings of the study established that loan portfolio quality has significant effect on the financial performance of the selected banks. Furthermore, Afrifa et al. (2019) carried out a study on the analysis of the loan portfolio management on the profitability of microfinance institutions using a descriptive survey. Using regression analysis, the study found that the loan portfolio has a direct influence on the profitability of the banks whereas non-performing loans and the new loans have different impact on the profitability of the bank. The study further asserted that the interest expense was rated highly as a factor that works to reduce the profits.

In the context of Nepal, Gauchan and Upadhyaya (2019) examined the credit portfolio management and its relationship with banks' financial performance. The study concluded that the joint venture banks of Nepal have managed their portfolio as per the standard parameter allocated by Nepal Rastra Bank (NRB) directives. The highest portion of loan in JVBs is invested in service sector and lowest in agriculture and mining sector. Similarly, the profitability of bank has positive relation to all the sector except consumption and other sector defining the sector-wise portfolio management provides a good framework to maintain the sustainability of banks. Similarly, Malla (2017) analyzed 6 Nepalese commercial banks and found that selected commercial banks have managed their loan portfolio as per the standard parameter of Nepal Rastra Bank (NRB) directives 2073. However, 96.41% of bank's lending is on collateral basis which indicates that, banks are conservative in lending. The study also suggested that Nepalese banks should increase their lending on priority sector and other various type of project-based lending to contribute in the development of country.

The above discussion shows that empirical evidences vary greatly across the studies on impact of credit portfolio management on bank 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 main purpose of the study is to analyze the impact of credit portfolio management on profitability of Nepalese commercial banks. Specifically, it examines the relationship of agriculture loan, real estate loan,

retail loan, government securities, corporate sector loan and term loan with return on assets and net profit margin 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 the conclusion.

## 2. Methodological aspects

The study is based on secondary data which were gathered from 27 commercial banks from 2016/17 to 2020/21, leading to a total of 135 observations. The main sources of data include Banking and Financial Statistics and Central Bureau of Statistics of Nepal published by Nepal Rastra Bank and annual reports of the selected commercial banks. 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                                   | Agricultural Development Bank Limited (ADBL)   | 2016/17 -2020/21  | 5            |
| 2                                   | Civil Bank Limited (CIVIL)                     | 2016/17- 2020/21  | 5            |
| 3                                   | Nabil Bank Limited (NABIL)                     | 2016/17 -2020/21  | 5            |
| 4                                   | Everest Bank Limited (EBL)                     | 2016/17 -2020/21  | 5            |
| 5                                   | Nepal Investment Bank Limited (NIBL)           | 2016/17 -2020/21  | 5            |
| 6                                   | Global IME Bank Limited (GBIME)                | 2016/17 -2020/21  | 5            |
| 7                                   | Nepal Bank Limited (NBL)                       | 2016/17 -2020/21  | 5            |
| 8                                   | Prabhu Bank Limited (PBL)                      | 2016/17 -2020/21  | 5            |
| 9                                   | Himalayan Bank Limited (HBL)                   | 2016/17 -2020/21  | 5            |
| 10                                  | Mega Bank Nepal Limited (MEGA)                 | 2016/17 -2020/21  | 5            |
| 11                                  | NIC Asia Bank Limited (NICA)                   | 2016/17 - 2020/21 | 5            |
| 12                                  | Citizen Bank Limited (CZBIL)                   | 2016/17 -2020/21  | 5            |
| 13                                  | Siddhartha Bank Limited (SBL)                  | 2016/17 -2020/21  | 5            |
| 14                                  | Sanima Bank Limited (SANIMA)                   | 2016/17 -2020/21  | 5            |
| 15                                  | Standard Chartered Bank Nepal Limited (SCBL)   | 2016/17 -2020/21  | 5            |
| 16                                  | NMB Bank Limited (NMBL)                        | 2016/17 -2020/21  | 5            |
| 17                                  | Machhapuchchhre Bank Limited (MBL)             | 2016/17 -2020/21  | 5            |
| 18                                  | Nepal Bangladesh Bank Limited (NBBL)           | 2016/17 -2020/21  | 5            |
| 19                                  | Rastriya Baniya Bank Limited (RBBL)            | 2016/17 -2020/21  | 5            |
| 20                                  | Bank of Kathmandu Limited (BOKL)               | 2016/17 -2020/21  | 5            |
| 21                                  | Prime Commercial Bank Limited (PCBL)           | 2016/17 -2020/21  | 5            |
| 22                                  | Kumari Bank Limited (KBL)                      | 2016/17 - 2020/21 | 5            |
| 23                                  | Laxmi Bank Limited (LBL)                       | 2016/17 -2020/21  | 5            |
| 24                                  | Century Commercial Bank Limited (CCBL)         | 2016/17 - 2020/21 | 5            |
| 25                                  | Nepal SBI Bank Limited (NSBI)                  | 2016/17 -2020/21  | 5            |
| 26                                  | Nepal credit and commerce Bank Limited (NCCBL) | 2016/17 -2020/21  | 5            |
| 27                                  | Sunrise Bank Limited (SRBL)                    | 2016/17 -2020/21  | 5            |
| <b>Total number of observations</b> |                                                |                   | <b>135</b>   |

Thus, the study is based on 135 observations.



## The model

The model used in this study assumes that bank profitability depends on various bank specific and macro-economic variables. The dependent variables are return on assets and net profit. The selected independent variables in this study are agriculture loan, real estate loan, retail loan, corporate sector loan, government securities and term loan. Therefore, the model takes the following forms:

Bank profitability =  $f$  (agriculture loan, real estate loan, retail loan, corporate sector loan, government securities, term loan).

More specifically, the given model has been segmented into following models:

$$ROA = \beta_0 + \beta_1 AL + \beta_2 REL + \beta_3 RTL + \beta_4 TL + \beta_5 CSL + \beta_6 GS + e$$

$$NPM = \beta_0 + \beta_1 AL + \beta_2 REL + \beta_3 RTL + \beta_4 CSL + \beta_5 GS + \beta_6 TL + e$$

Where,

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

NPM = Net profit margin as measured net profit to gross income, in percentage.

AL = Agriculture loan is the loan to fund vegetables, crops, fruit and livestock, Rs in million.

REL = Real estate loan is the loan done for construction of house or resources to acquire housing project by household, Rs in million.

RTL = Retail loan is the loan made for personal purpose, education loan and flexi loan, Rs in million.

CSF = Corporate sector loan is the loan made to finance company, insurance, and micro finance, Rs in million.

GS = Government securities are the loan made to local government, government guarantee and government bonds, Rs in millions.

TL = Term loan is the loan that last between one and ten years, Rs in millions.

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

## Agriculture loan

Gonenc and Kilichan (2004) revealed that agriculture lending has significant positive impact on performance level of Turkish Bank. Likewise, Abayomi and Salami (2018) examined the impact of commercial bank lending on agricultural production and productivity in Nigeria. The study concluded that agriculture lending positive has significant impact on the performance of financial institution. Similarly, Silici and Locke (2013) found that agriculture lending has a positive impact on return on assets and net profit margin of banks in Africa. Likewise, Eicher and Staaz (1998) explained that agriculture credit has a positive impact on performance of financial institution and productivity of farmers. Ombaba (2013) found that agriculture lending has a positive and significant impact on return on assets and return on equity. Furthermore, Onguka (2014) revealed that agriculture loan has a positive growth rate on the profitability of commercial banks in Kenya. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between agriculture loan and bank profitability.

## Real estate loan

Real estate financing is the provision of finance or capital for housing purchase or building. Martins et al. (2019) examined the determinants of real estate bank profitability. The study showed that increase in credit to real estate and retail loans leads to increase in the profitability of banks. Similarly, Rosen et al.

(1989) found the positive but insignificant correlation between returns and real-estate loan. The study also revealed that non-real-estate assets is outweighed by the bigger variability of real estate returns once land investment exceeds a comparatively low threshold of around four percent of total assets. Moreover, Macit (2011) found that the commercial banks that have a high proportion of real estate loans in their portfolios. Financial institutions that specialize in real estate face a high exposure to real estate risk and greater financial performance. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between real estate loan and bank profitability.

## **Retail loan**

Retail lending is mainly issued to individual customer. Education loan, hire purchase loan, personal loan falls under this category. Retail lending is an important line of business for the banking industry, and real estate financing activities contribute significantly to the economy (Bienert, 2006). Ibrahim (2015) showed that retail lending results in better performance in terms of profitability in the context of United Arab Emirates. Similarly, Amidu (2013) found that retail lending has positive impact on profitability of banks as it is more focus on providing various loan to different sector which provide great diversity in portfolio. Likewise, Joseph (2019) stated that retail loan has stronger and more positive influences on net profit margin. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between retail loan and bank profitability.

## **Corporate sector loan**

Corporate share investment includes the investment in the shares of organized institutions. Smith (2009) argued that firm's monetary performance and businesses is influenced by capital market and investment in corporate shares investment. Similarly, Duraj and Moci (2015) found that investment in shares afterward earn investment financial gain to the investors. In addition, the liquid nature of those markets makes it attainable for the investors to exchange possession of securities, and reap capital gains there on. This helps in better financial performance of the banks. Santos (1999) suggested that there is positive relationship between corporate sector lending and the bank's profitability. Moreover, Isabwa and Wekesa (2019) revealed that corporate sector lending has a strong positive relationship with financial performance of banks. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is positive relationship between corporate sector loan and bank profitability.

## **Government securities**

Lawal and Onohaebi (2010) stated that government securities carry the least risk relative to other assets because they are backed by the strength, full faith and credibility of the borrowing state. Investment on government securities have the greatest significance in generating net operating profits in banks (Gikonyo, 2011). Similarly, Ndugbu et al. (2016) showed that money market instruments have positive relationship and significant effect on bank performance in Nigeria. Moreover, Kipleting (2016) revealed that investment on government security such as bills and bond are considered to be significantly safer investment compared to the other assets classes. Likewise, Agblobi et al. (2020) revealed that government securities investment has a positive relationship with the bank's profitability. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between government securities and bank profitability.

## Term loan

A term loan usually has a payback period between one and five years. Depending upon the deal negotiated, these loans are normally secured (collateralized by assets) and guaranteed by the entrepreneurs. Abor and Biekpe (2005) found a negative relationship between profitability and long-term debt in the context of Ghana. Rates and terms on term loans vary greatly based on the lending institution's policies and the business's age and financial status (Bichsel and Blum, 2005). Similarly, Ferati (2012) showed a negative correlation of long-term debts with financial performance. Likewise, Menor and Roth (2018) showed the rate of return holds an inverse relationship with long-term debt and equity. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is negative relationship between term loan and bank profitability.

## 3. Result and discussion

### Descriptive statistics

Table 2 presents the descriptive statistics of selected dependent and independent variables during the period 2016/17 to 2020/21.

**Table 2 : Descriptive statistics**

This table shows the descriptive statistics of dependent and independent variables for the study period from 2016/17 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and NPM (Net profit margin as measured net profit to gross income, in percentage). The independent variables are AL (Agriculture loan is the loan to fund vegetables, crops, fruit and livestock, Rs in million), REL (Real estate loan is the loan done for construction of house or resources to acquire housing project by household, Rs in million), RTL (Retail loan is the loan made for personal purpose, education loan and flexi loan, Rs in million), CSL (Corporate sector loan is the loan made to finance company, insurance, and micro finance, Rs in million), GS (Government securities are the loan made to local government, government guarantee and government bonds, Rs in millions) and TL (Term loan is the loan that last between one and ten years, Rs in millions).

| Variables | Minimum  | Maximum    | Mean      | S.D.      |
|-----------|----------|------------|-----------|-----------|
| ROA       | 0.01     | 2.89       | 1.55      | 0.53      |
| NPM       | 6.68     | 47.78      | 23.44     | 10.55     |
| AL        | 5164.95  | 448023.14  | 56006.29  | 65684.86  |
| REL       | 58421.24 | 1046186.42 | 231772.65 | 137975.79 |
| RTL       | 1799.21  | 322986.84  | 83962.69  | 48940.38  |
| CSL       | 2687.73  | 199904.66  | 53578.55  | 32573.14  |
| GS        | 1.03     | 30258.44   | 2360.12   | 3674.22   |
| TL        | 23807.33 | 609565.39  | 195483.59 | 118054.25 |

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 20 Nepalese commercial banks for the study period from 2016/17 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and NPM (Net profit margin as measured net profit to gross income, in percentage). The independent variables are AL (Agriculture loan is the loan to fund vegetables, crops, fruit and livestock, Rs in million), REL (Real estate loan is the loan done for construction of house or resources to acquire housing project by household, Rs in million), RTL (Retail loan is the loan made for personal purpose, education loan and flexi loan, Rs in million), CSL (Corporate sector loan is the loan made to finance company, insurance, and micro finance, Rs in million), GS (Government securities are the loan made to local government, government guarantee and government bonds, Rs in millions) and TL (Term loan is the loan that last between one and ten years, Rs in millions).

| Variables | ROA     | NPM     | AL      | REL     | RTL     | CSL     | GS    | TL |
|-----------|---------|---------|---------|---------|---------|---------|-------|----|
| ROA       | 1       |         |         |         |         |         |       |    |
| NPM       | 0.450** | 1       |         |         |         |         |       |    |
| AL        | 0.170*  | -0.098  | 1       |         |         |         |       |    |
| REL       | 0.182*  | 0.130   | 0.679** | 1       |         |         |       |    |
| RTL       | -0.160  | 0.042   | 0.128   | 0.374** | 1       |         |       |    |
| CSL       | 0.018   | 0.082   | -0.012  | 0.307** | 0.677** | 1       |       |    |
| GS        | 0.125   | 0.349** | -0.002  | 0.226** | 0.254** | 0.220*  | 1     |    |
| TL        | -0.220* | -0.145  | 0.461** | 0.525** | 0.533** | 0.385** | 0.141 | 1  |

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

Table 3 shows that agriculture loan has a positive relationship with return on assets. It indicates that increase in agriculture loan leads to increase in return on assets. Similarly, real estate loan is positively related to return on assets. It reveals that higher the real estate loan, higher would be the return on assets. In addition, the study shows that retail loan has a negative relationship with return on assets. It indicates that increase in retail loan leads to decrease in return on assets. Moreover, corporate sector loan has a positive relationship with return on assets. It reveals that higher the corporate sector loan, higher would be the return on assets. Similarly, government securities are positively related to return on assets. It indicates that increase in government securities leads to increase in return on assets. However, term loan is negatively related to return on assets. It indicates that higher the term loan, lower would be the return on assets.

On the other hand, the results shows that agriculture loan has a negative relationship with net profit margin. It indicates that increase in agriculture loan leads to decrease in net profit margin. Similarly, real estate loan is positively related to net profit margin. It reveals that higher the real estate loan, higher would be the net profit margin. Likewise, retail loan has a positive relation with net profit margin. It indicates that increase in retail loan leads to increase in net profit margin. Similarly, corporate sector loan is positively related with net profit margin. It reveals that higher the corporate sector loan, higher would be the net profit margin. Moreover, government securities have positive relationship with net profit margin. It indicates that increase in government securities lead to increase in net profit margin. However, term loan is negatively related to net profit margin. It reveals that increase in term loan leads to decrease in net profit margin.

## Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of agriculture loan, real estate loan, retail loan, corporate sector loan, government securities and term loan on return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of agriculture loan, real estate loan, retail loan, corporate sector loan, government securities and term loan on return on assets

The results are based on panel data 27 commercial banks with 135 observations for the period from 2016/17 to 2020/21 by using the linear regression model. The model is  $ROA = \beta_0 + \beta_1 AL + \beta_2 REL + \beta_3 RTL + \beta_4 TL + \beta_5 CSL + \beta_6 GS + e$ , 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 AL (Agriculture loan is the loan to fund vegetables, crops, fruit and livestock, Rs in million), REL (Real estate loan is the loan done for construction of house or resources to acquire housing project by household, Rs in million), RTL (Retail loan is the loan made for personal purpose, education loan and flexi loan, Rs in million), CSL (Corporate sector loan is the loan made to finance company, insurance, and micro finance, Rs in million), GS (Government securities are the loan made to local government, government guarantee and government bonds, Rs in millions) and TL (Term loan is the loan that last between one and ten years, Rs in millions).

| Model | Intercept          | Regression coefficients of |                    |                     |                  |                  |                     | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|--------------------|---------------------|------------------|------------------|---------------------|-------------------------|-------|---------|
|       |                    | AL                         | REL                | RTL                 | CSL              | GS               | TL                  |                         |       |         |
| 1     | 1.036<br>(1.784)   | 0.049<br>(0.892)           |                    |                     |                  |                  |                     | 0.002                   | 0.534 | 0.797   |
| 2     | 0.73<br>(0.681)    |                            | 0.187<br>(2.130)*  |                     |                  |                  |                     | 0.110                   | 0.527 | 4.539   |
| 3     | 2.897<br>(4.013)** |                            |                    | -0.120<br>(0.160)   |                  |                  |                     | 0.018                   | 0.529 | 3.487   |
| 4     | 1.402<br>(1.867)*  |                            |                    |                     | 0.012<br>(0.202) |                  |                     | 0.070                   | 0.536 | 0.041   |
| 5     | 1.355<br>(9.446)** |                            |                    |                     |                  | 0.031<br>(0.147) |                     | 0.008                   | 0.532 | 2.126   |
| 6     | 3.773<br>(4.409)** |                            |                    |                     |                  |                  | -0.185<br>(2.598)** | 0.141                   | 0.523 | 6.749   |
| 7     | 0.888<br>(0.810)   | 0.055<br>(0.737)           | 0.247<br>(2.062)*  |                     |                  |                  |                     | 0.022                   | 0.528 | 2.533   |
| 8     | 0.560<br>(0.510)   | 0.097<br>(1.335)           | 0.404<br>(3.205)** | -0.213<br>(3.164)** |                  |                  |                     | 0.085                   | 0.511 | 5.141   |
| 9     | 0.302<br>(0.270)   | 0.067<br>(0.896)           | 0.357<br>(2.765)** | -0.299<br>(3.446)** | 1.440<br>(1.534) |                  |                     | 0.94                    | 0.508 | 4.483   |
| 10    | 0.160<br>(0.141)   | 0.480<br>(0.63)            | 0.315<br>(2.384)*  | -0.313<br>(3.559)** | 0.143<br>(1.528) | 0.03<br>(1.407)  |                     | 0.101                   | 0.508 | 4.01    |
| 11    | 0.848<br>(0.764)   | 0.030<br>(0.395)           | 0.371<br>(2.915)** | -0.202<br>(2.280)*  | 0.17<br>(1.901)  | 0.029<br>(1.443) | -0.325<br>(1.632)   | 0.179                   | 0.484 | 5.856   |

**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 agriculture loan are positive with return on assets. It indicates that agriculture loan has positive impact on return on assets. This finding is consistent with the findings of Eicher and Staaz (1998). Similarly, the beta coefficients for real estate are positive with return on assets. It indicates that real estate loan has a positive impact on return on assets. This finding is similar to the findings of Macit (2011). Likewise, the beta coefficients for retail loan are negative with return on assets. It indicates that retail loan has a negative impact on return on assets. This finding is inconsistent with the

findings of Menor and Roth (2008). Moreover, the beta coefficients for corporate sector loan are positive with return on assets. It indicates that corporate sector loan has a positive impact on return on assets. This finding is consistent with the findings of Kipleting and Bokongo (2016). Similarly, beta coefficients for government securities are positive with return on assets. It reveals that government securities have a positive impact on return on assets. This finding is similar to the findings of Agblobi et al. (2020). Likewise, beta coefficients of term loan are negative with return on assets. It indicates that term loan has a negative impact on return on assets. This finding is consistent with findings of Abor and Biekpe (2005).

The regression results of agriculture loan, real estate loan, retail loan, corporate sector loan, government securities and term loan on net profit margin of Nepalese commercial banks have been presented in Table 5.

**Table 5:** Estimated regression results of agriculture loan, real estate loan, retail loan, corporate sector loan, government securities and term loan on net profit margin

The results are based on panel data 27 commercial banks with 135 observations for the period from 2016/17 to 2020/21 by using the linear regression model. The model is  $NPM = \beta_0 + \beta_1 AL + \beta_2 REL + \beta_3 RTL + \beta_4 TL + \beta_5 CSL + \beta_6 GS + e$ , where the dependent variable is NPM (Net profit margin as measured net profit to gross income, in percentage). The independent variables are AL (Agriculture loan is the loan to fund vegetables, crops, fruit and livestock, Rs in million), REL (Real estate loan is the loan done for construction of house or resources to acquire housing project by household, Rs in million), RTL (Retail loan is the loan made for personal purpose, education loan and flexi loan, Rs in million), CSL (Corporate sector loan is the loan made to finance company, insurance, and micro finance, Rs in million), GS (Government securities are the loan made to local government, government guarantee and government bonds, Rs in millions) and TL (Term loan is the loan that last between one and ten years, Rs in millions).

| Model | Intercept           | Regression coefficients of |                    |                  |                  |                    |                   | Adj. R_bar <sup>2</sup> | SEE    | F-value |
|-------|---------------------|----------------------------|--------------------|------------------|------------------|--------------------|-------------------|-------------------------|--------|---------|
|       |                     | AL                         | REL                | RTL              | CSL              | GS                 | TL                |                         |        |         |
| 1     | 36.436<br>(3.138)** | -1.233<br>(1.138)          |                    |                  |                  |                    |                   | 0.002                   | 10.539 | 1.296   |
| 2     | 8.845<br>(0.0414)   |                            | 2.644<br>(1.513)   |                  |                  |                    |                   | 0.010                   | 10.5   | 2.29    |
| 3     | 23.982<br>(1.661)   |                            |                    | 0.048<br>(0.007) |                  |                    |                   | 0.008                   | 10.591 | 0.001   |
| 4     | 9.513<br>(0.945)    |                            |                    |                  | 1.301<br>(0.945) |                    |                   | 0.001                   | 10.555 | 0.892   |
| 5     | 12.556<br>(4.693)** |                            |                    |                  |                  | 1.678<br>(4.294)** |                   | 0.115                   | 9.924  | 18.442  |
| 6     | 52.466<br>(3.062)** |                            |                    |                  |                  |                    | -2.418<br>(1.696) | 0.014                   | 10.477 | 2.876   |
| 7     | 21.42<br>(1.014)    | -4.346<br>(3.048)**        | 7.424<br>(3.215)** |                  |                  |                    |                   | 0.068                   | 10.578 | 5.86    |
| 8     | 13.951<br>(0.525)   | -4.684<br>(3.235)**        | 8.669<br>(3.457)** | 1.713<br>(1.259) |                  |                    |                   | 0.072                   | 10.165 | 4.453   |
| 9     | 15.859<br>(0.706)   | -4.524<br>(3.007)**        | 8.418<br>(3.250)** | 2.153<br>(1.237) | 0.765<br>(0.407) |                    |                   | 0.66                    | 10.197 | 3.360   |
| 10    | 1.187<br>(0.55)     | 3.534<br>(2.424)*          | 6.262<br>(2.471)*  | 2.880<br>(1.725) | 0.710<br>(0.396) | 1.529<br>(3.756)*  |                   | 0.151                   | 9.718  | 5.779   |
| 11    | 9.916<br>(0.453)    | -2.534<br>(1.697)          | 6.979<br>(2.782)** | 1.452<br>(0.831) | 1.064<br>(0.603) | 1.522<br>(3.803)** | -4.172<br>(2.366) | 0.181                   | 9.551  | 5.921   |

**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 profit margin is dependent variable.

Table 5 shows that the beta coefficients for agriculture loan are negative with net profit margin. It indicates that agriculture loan has negative impact on net profit margin. This finding is inconsistent with the findings of Silici and Locke (2013). The beta coefficients for real estate are positive with net profit margin. It indicates that real estate loan has a positive impact on net profit margin. This finding is similar to the findings of Rosen et al. (1989). Likewise, the beta coefficients for retail loan are positive with net profit margin. It indicates that retail loan has a positive impact on net profit margin. This finding is consistent with the findings of Ibrahim (2015). Moreover, the beta coefficients for corporate sector loan are positive with net profit margin. It indicates that corporate sector loan has a positive impact on net profit margin. This finding is consistent with the findings of Isabwa and Wekesa (2019). Similarly, the beta coefficients for government securities are positive with net profit margin. It reveals that government securities have a positive impact on net profit margin. This finding is consistent with the findings of Ndugbu et al. (2016).

## 4. Summary and conclusion

As financial intermediaries, banks play an important role in the operation of an economy. Banks are the sole providers of funds, and their stability is of paramount importance to the financial system. As such, an understanding of determinants of their profitability is essential and crucial to the stability of the economy. Credit portfolio management refers to the way of using funds to the different pool of loan so that the seamless returns be ensured with the mitigation of the risks involved in it. Banks can intend to diversify its credit portfolio to increase the performance and to reduce the credit portfolio risk. Hence, banks offer varieties of investment and credit schemes to address the different needs of the different customers. This helps in creating portfolio diversification in terms of loans, deposits, assets, and geography. Every bank must have a well-defined, qualitative and lucrative portfolio diversification strategy to ensure the sound financial performance.

This study examines the impact of credit portfolio management on the profitability of Nepalese commercial banks. The study is based on secondary data of 27 Nepalese commercial banks with 135 observations for the study period from 2016/17 to 2020/21.

The study showed that agriculture loan, real estate loan, corporate sector loan and government securities have positive impact on bank return on assets of commercial banks in Nepal. In addition, retail loan and term loan have negative impact on return on assets. Likewise, agriculture loan and term loan have negative impact on net profit margin. The study concluded that term loan is the most influencing factors that explain the changes in the profitability in terms of return on assets. Likewise, the study also concluded that the most dominant factor that explain the profitability in term of net profit margin is government securities in the context of Nepalese commercial banks.



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## Abstract

*This study examines the impact of macro-economic factors on the lending behaviour of Nepalese commercial banks. Total loan to total asset and total loan to total deposit are selected as the dependent variables. Similarly, gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 128 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic factors on the lending behaviour of Nepalese commercial banks.*

*The study showed that gross domestic product has a positive impact on total loan to total asset and total loan to total deposit. It indicates that the increase in gross domestic product leads to increase in total loan to total asset and total loan to total deposit. Similarly, the study showed that inflation rate has a negative impact on total loan to total asset and total loan to total deposit. It means that increase in inflation rate leads to decrease in total loan to total asset and total loan to total deposit. Moreover, the study also showed that money supply has a positive impact on total loan to total asset and total loan to total deposit. It indicates that the increase in money supply leads to increase in total loan to total asset and total loan to total deposit. Furthermore, interest rate has a negative impact on total loan to total asset and total loan to total deposit. It indicates that the increase in interest rate leads to decrease in total loan to total asset and total loan to total deposit. Likewise, unemployment rate has a positive impact on total loan to total asset and total loan to total deposit. It indicates that the increase in unemployment rate leads to increase in total loan to total asset and total loan to total deposit.*

**Key words:** Total loan to total asset, total loan to total deposit, gross domestic product, inflation rate, exchange rate, money supply, interest rate and unemployment rate.

# 1. Introduction

Commercial banks are important drivers of economic growth and development. They play intermediation role by channelling funds from the surplus spending units to the deficit spending units of the economy, therefore, transforming bank deposits into credits (Yakubu and Affoi, 2014). Lending plays a vital role in commercial banks daily banking activities where loan and advances are the largest element in the bank's asset portfolio. It is also the major sources of revenue generation for the bank (Malede, 2014). Commercial banks play an important role in the economy by supplying necessary funds for economic activity. Commercial banks grant loans and advances to individuals, business organizations as well as government in order to enable them embark on investment and development activities (Felicia, 2011).

The availability of investable capital in the form of a loan from a commercial bank plays an important role in financing economic projects and activities that support economic growth and development. It has been widely argued that access to credit bank loan fuels economic activities (Eniola and Entebang, 2015). Typically, once a bank perceives the macroeconomic environment to be stable, they form expectations that borrowers will be better able to repay loans due to their improved ability to accurately predict income stream over the life of the loan.

As a result, banks adjust their lending behavior in response to the signals from these macroeconomic factors, with positive signals prompting banks to lend more and negative signals prompting banks to lend less. Talavera et al. (2012) concluded that banks make out more loans during periods of boom and reduced level of macroeconomic uncertainty and curtail lending when the economy is in recession. Bakri et al. (2017) examined the determinants of Islamic bank financing in Malaysia. The study asserted that both microeconomic and macroeconomic factors are significant for the banks' loan supply. Similarly, Somoye and Ilo (2009) stated that though the volume of loans granted by a bank is a function of its internal characteristics such as size, deposit base, liquidity, credit policy. However, volume of loans, to a large extent, are influenced by the general macroeconomic factors. Such macroeconomic factors include inflation, money supply, industrial capacity utilization, employment level, exchange rate, interest rate and GDP growth rate.

Taner (2000) examined the effects of inflation uncertainty on credit markets. The study revealed that unpredictable inflation raises interest rates, decreases loan supply and affect loan demand. The study concluded that an increase in inflation may raise the bank lending rates and lead to low bank lending volumes. Moreover, Amidu and Wolfe (2008) analysed the constrained implication of monetary policy on bank lending in Ghana between 1998 and 2004. The study revealed that the central bank prime rate and inflation rate negatively affect bank lending. Similarly, Samad et al. (2020) investigated the determinants of household debt in emerging economies. The study found a negative association between inflation and household debt. On contrary, Yudaruddin (2017) examined the economic conditions and lending behavior in Indonesia. The study concluded that there is no relationship between inflation and bank lending. Ladime et al. (2013) investigated the determinants of bank lending behaviour in Ghana. The study revealed a negative and statistically significant effect of foreign exchange rate on banks' lending performance in Ghanaian economy. Similarly, Rusli and Rokhim (2012) examined the macroeconomics factors and bank lending behaviour In Indonesia. The study concluded that a slumping exchange rate of Rupiah brought Indonesian businesses to hold off their business expansion plan due to the escalating risk. This situation ultimately slumps the demand for credit from financial institutions. Lucky and Lyndon (2016) examined the determinants of commercial bank lending policy in Nigeria. The study revealed that exchange rate

has a significant positive effect on bank lending behaviour. Furthermore, Keshtgar (2020) investigated the impact of exchange rate volatility on banking performance. The study revealed that exchange rate volatility has a positive effect on increasing the ratio of lending to total bank deposits.

Richard and Okoye (2014) examined the factors that affect lending behavior of deposit money banks in Nigeria. The study concluded that higher interest rate tends to increase the volume of loan and advances grant by the bank. Similarly, Karim et al. (2011) investigated the bank lending channel of monetary policy. The study concluded that the lending rate negatively affect the bank lending in Malaysia. Banks often charge rates that are not too low because of its profitability and not too high in order not to scare the customers away. Banks are therefore always careful with their decision to lend out due to some factors that may affect the bank adversely such as inflation rate, interest rate, the level of deposit, liquidity of the bank, etc. (Adewale, 2020). Similarly, Amidu (2006) investigated the nexus between monetary policy and bank lending in Ghana. The study revealed that Ghanaian bank lending is significantly influenced by the country's economic activities and changes in the money supply. Moreover, Friedman (1968) examined the role of monetary policy in influencing the cost and volume of credit. The study concluded that in the short run, an increase in money supply leads to a decrease in the interest rate, with a resultant increase in bank lending. On contrary, Yunusa et al. (2020) investigated the impact of monetary variables on bank lending in Nigeria. The study revealed that liquidity ratio and money supply have negative insignificant effect on loans and advances. However, Lucky and Lyndon (2016) revealed that exchange rate and inflation rate have significant positive effects on bank lending behaviour.

Djiogap and Ngomsa (2012) investigated the determinants of bank long-term loan using a sample of 35 commercial banks of six African countries over the period 2001-2010. The study concluded that a bank's ability to extend long-term business loans depends on its size, capitalization, GDP growth and the availability of long-term liabilities. In addition, Constant and Ngomsa (2012) examined the long-term lending behavior of 35 commercial banks in Central Africa. The study discovered that the gross domestic product has a positive and significant relationship with the bank lending. Similarly, Trenca et al. (2015) analyzed the impact of macroeconomic factors on bank liquidity for a particular group of countries recently affected by adverse economic and financial conditions. The study revealed that an increase in the unemployment rate can be translated into an increasing of non-performing loans and thus lowering bank liquidity. Likewise, Alnefaee (2019) investigated the macroeconomics determinants of consumer lending in Saudi Arabia. The study found that GDP and per capita have a positive effect on consumer lending. Moreover, Marshal (2017) investigated the impact of macroeconomic dynamics on the bank lending behavior in Nigeria. The study showed that gross domestic product has a negative impact on bank lending behavior in the short run.

In the context of Nepal, Goet (2021) investigated the effect of determinants of lending behavior on loan and advances in joint venture commercial banks in Nepal. The study found that total deposit and inflation rate have significant impact on total loans and advances. However, cash reserve ratio and interest rate spread do not have any significant influence on total loans and advances. Timsina (2017) examined the determinants of bank lending in Nepal for the period 1975 –2014. The study revealed that gross domestic product and liquidity ratio of banks have the significant impacts on their lending behaviour. Similarly, Dhungana and Pradhan (2017) analysed the effect of commercial bank lending on inflation in Nepal. The study showed that bank lending has a positive effect on the inflation in Nepal. In addition, Bhattarai (2019) investigated the determinants of commercial banks' lending behavior. The study explored the effect of bank specific characteristics and to identify external factors that determine commercial banks' lending

behavior in Nepal. The study concluded that liquidity ratio, interest rate spread and exchange rate were significant in determining lending behavior in Nepalese commercial banks. Moreover, Bhattarai (2020) examined the determinants of commercial banks' lending in Nepal. The study found that macroeconomic variables such as gross domestic products growth rate and inflation rate have not significant effect on loan and advance.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of macro-economic factors on lending behaviour of 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 main purpose of the study is to analyse the impact of macro-economic factors on the lending behaviour of Nepalese commercial banks. Specifically, it examines the relationship of gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate with total loan to total asset and total loan to total deposit 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 16 commercial banks out of 27 commercial banks on the basis of market capitalization for the period from 2013/14 to 2020/21, leading to a total of 128 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|----------------------------|---------------------------------------|-------------------|--------------|
| <b>Public banks</b>        |                                       |                   |              |
| 1                          | Nepal Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 2                          | Agricultural Development Bank Limited | 2013/14 - 2020/21 | 8            |
| <b>Joint venture banks</b> |                                       |                   |              |
| 3                          | Nabil Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 4                          | NMB Bank Limited                      | 2013/14 - 2020/21 | 8            |
| 5                          | Everest Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 6                          | Himalayan Bank Limited                | 2013/14 - 2020/21 | 8            |
| <b>Private banks</b>       |                                       |                   |              |
| 7                          | NIC Asia Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 8                          | Global IME Bank Limited               | 2013/14 - 2020/21 | 8            |
| 9                          | Prime Commercial Bank Limited         | 2013/14 - 2020/21 | 8            |
| 10                         | Nepal Investment Bank Limited         | 2013/14 - 2020/21 | 8            |
| 11                         | Siddhartha Bank Limited               | 2013/14 - 2020/21 | 8            |

|                                     |                                     |                   |            |
|-------------------------------------|-------------------------------------|-------------------|------------|
| 12                                  | Mega Bank Nepal Limited             | 2013/14 - 2020/21 | 8          |
| 13                                  | Prabhu Bank Limited                 | 2013/14 - 2020/21 | 8          |
| 14                                  | Kumari Bank Limited                 | 2013/14 - 2020/21 | 8          |
| 15                                  | Sanima Bank Limited                 | 2013/14 - 2020/21 | 8          |
| 16                                  | Citizens Bank International Limited | 2013/14 - 2020/21 | 8          |
| <b>Total number of observations</b> |                                     |                   | <b>128</b> |

Thus, the study is based on the 128 observations.

## The model

The model used in this study assumes that the bank's lending behaviour depends upon macro-economic factors. The dependent variables selected for the study are total loan to total asset and total loan to total deposit. Similarly, the selected independent variables are gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate. Therefore, the model takes the following form:

Lending behaviour =  $f$  (gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate)

More specifically,

$$TL/TA = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 EXR + \beta_4 IR + \beta_5 MS + \beta_6 UMR + \epsilon_{it}$$

$$TL/TD = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 EXR + \beta_4 IR + \beta_5 MS + \beta_6 UMR + \epsilon_{it}$$

Where,

TL/TA = Total loan to total assets as measured by the ratio of total loan to total asset, in percentage.

TL/TD = Total loan to total deposit as measured by the ratio of total loan to total deposit, in percentage.

GDP = Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion.

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

EXR = Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD.

IR = Interest rate as measured by the lending cost of the bank, in percentage.

MS = Money supply as measured by the broad money, USD in billion.

UMR = Annual unemployment rate, in percentage.

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

## Gross domestic product (GDP)

Gross domestic product is a monetary measure of the market value of all the final goods and services produced in a specific time period by countries. Diriba (2020) analysed the determinants to lending behaviour in commercial banks of Ethiopia. The study concluded that gross domestic product has a positive but statistically insignificant effect on lending behaviour. Thaker et al. (2014) analysed the macroeconomic determinants of bank credit in Malaysia. The study showed that gross domestic product has a positive long run relationship with the bank credit. Similarly, Jelilov et al. (2016) found a strong and a positive relationship between the gross domestic product and the lending behaviour in Nigeria. In addition, John (2014) revealed that there is a positive relationship between GDP and lending behaviour. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a positive relationship between gross domestic product and lending behaviour.



## **Inflation rate**

Inflation in the economy has significant effect on lending behaviour of banks. Colin and Kacaribu (2021) investigated the impact of macroeconomic volatility on bank credit allocation. The study revealed a negative relationship between inflation volatility and bank lending. Similarly, Uwazie and Aina (2015) examined the cause and effect of monetary policy variables on commercial banks loans and advances in Nigeria. The study showed that inflation rate has a negative impact on commercial bank loans and advances. Similarly, Ziramba (2008) found a negative relationship between inflation rate and bank credit. Likewise, Amidu (2006) stated that inflation has a negative relationship with bank lending. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a negative relationship between inflation rate and lending behaviour.

## **Exchange rate**

Prevailing exchange rate is another macroeconomic factor that influences lending behaviour of commercial banks. Onaolapo and Habeeb (2017) investigated the impact of monetary policy on commercial banks' lending behaviour in Nigeria. The study revealed that exchange rate has statistically significant and positive impact on the bank lending behaviour. In the same way, Mallick and Moore (2005) found a positive but insignificant impact of exchange rate on bank credit. Nkwoma (2014) found a positive relationship between exchange rate and bank credit. Similarly, Adeleke and Awodumi (2018) revealed that exchange rate has a positive long-run impact on bank credit to private sector in Nigeria. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a positive relationship between exchange rate and lending behaviour.

## **Interest rate**

Interest rate is a core factor affecting bank loans. Ayieyo (2016) examined the determinants of lending behavior in selected commercial banks in Kenya. The study revealed that lending interest rates are negatively related to total loans and advance. In addition, Azira et al. (2018) examined the determinants of commercial bank lending in Malaysia. The study revealed that lending rate influences commercial bank lending negatively. Similarly, Akinlo and Oni (2015) stated that loan interest rates have a negative effect on bank credit growth. Likewise, Kashyap et al. (1993) found a negative impact of interest rate on bank lending. Tomak (2013) documented that interest rate has a negative impact on bank lending. In addition, Salmanov et al. (2015) found a negative but insignificant impact of interest rate on bank lending. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a negative relationship between interest rate and lending behaviour.

## **Unemployment rate**

Unemployment is considered as reflecting the situation in the labour market and potentially having an impact on the demand for loans and the clients' risk (Janda and Zetek, 2014). Albertazzi et al. (2016) found that unemployment rate has a negative impact on bank credit. Likewise, Kaufmann (2020) stated that unemployment rate has a negative relationship with bank lending. In addition, Ibrahim and Ndidi (2020) found that unemployment rate has a negative relationship with bank lending. Louzis et al. (2012)



investigated macroeconomic and bank-specific determinants of NPL in Greece. The study concluded that economic growth has negative impact on NPL, while unemployment has positive impact on NPL. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a negative relationship between unemployment rate and lending behaviour.

## Money supply

The money supply refers to the total volume of currency held by the public at a particular point in time. Alkhazaleh (2017) examined the determinants of bank lending in Jordan. The study revealed that there is a significant positive effect of money supply and growth on gross domestic product in determining the level of lending. Salmanov et al. (2015) investigated the impact of monetary policy on bank lending in Russia. The study found a positive impact of money supply on corporate lending. Similarly, Miah and Banik (2017) stated that the broad money supply does not have any distinct effect of its own on the private sector borrowing, rather the effect is transmitted through the interest rate. Furthermore, Onaolapo and Habeeb (2017) revealed that money supply has a positive influence on commercial bank loans and advances. In addition, Onoh and Nwachukwu (2017) found that there is a positive and significant relationship between money supply and bank loans and advances. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a positive relationship between money supply and lending behaviour.

## 3. Results and discussion

### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period of 2013/14 to 2020/21. The dependent variables are TL/TA (Total loan to total assets as measured by the ratio of total loan to total asset, in percentage) and TL/TD (Total loan to total deposit as measured by the ratio of total loan to total deposit, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), IR (Interest rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UMR (Annual unemployment rate, in percentage).

| Variables | Minimum | Maximum | Mean   | S. D. |
|-----------|---------|---------|--------|-------|
| TL/TA     | 51.30   | 76.60   | 68.72  | 5.27  |
| TL/TD     | 54.90   | 104.80  | 83.97  | 8.66  |
| GDP       | 20.00   | 34.27   | 28.81  | 5.67  |
| INF       | 3.60    | 9.93    | 6.15   | 2.23  |
| MS        | 75.36   | 135.76  | 98.83  | 17.83 |
| EXR       | 98.30   | 118.20  | 107.78 | 6.93  |
| IR        | 5.00    | 8.00    | 6.69   | 1.09  |
| UMR       | 2.63    | 4.44    | 3.10   | 0.53  |

## 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 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are TL/TA (Total loan to total assets as measured by the ratio of total loan to total asset, in percentage) and TL/TD (Total loan to total deposit as measured by the ratio of total loan to total deposit, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), IR (Interest rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UMR (Annual unemployment rate, in percentage).

| Variables | TL/TA    | TL/TD    | GDP      | INF      | MS       | EXR      | IR       | UMR |
|-----------|----------|----------|----------|----------|----------|----------|----------|-----|
| TL/TA     | 1        |          |          |          |          |          |          |     |
| TL/TD     | 0.790**  | 1        |          |          |          |          |          |     |
| GDP       | 0.331**  | 0.664**  | 1        |          |          |          |          |     |
| INF       | -0.291** | -0.536** | -0.802** | 1        |          |          |          |     |
| MS        | 0.200*   | 0.502**  | 0.734**  | -0.530** | 1        |          |          |     |
| EXR       | 0.247**  | 0.567**  | 0.848**  | -0.540** | 0.906**  | 1        |          |     |
| IR        | -0.223*  | -0.536** | -0.818** | 0.507**  | -0.940** | -0.968** | 1        |     |
| UMR       | 0.159    | 0.346**  | 0.438**  | -0.472** | 0.810**  | 0.616**  | -0.614** | 1   |

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

Table 3 reveals that gross domestic product has a positive relationship with total loan to total asset. It means that increase in gross domestic product leads to increase in total loan to total asset. However, there is a negative relationship between inflation rate and total loan to total asset. It means that increase in inflation rate leads to decrease in total loan to total asset. However, money supply has a positive relationship with total loan to total asset. It shows that increase in money supply leads to increase in total loan to total asset. Furthermore, there is a positive relationship between exchange rate and total loan to total asset. It indicates that increase in exchange rate leads to increase in total loan to total asset. In contrast, interest rate has a negative relationship with total loan to total asset. It indicates that increase in interest rate leads to decrease in total loan to total asset. Further, this study shows that there is a positive relationship between unemployment rate and total loan to total asset. It means that increase in unemployment rate leads to increase in total loan to total asset in Nepalese commercial banks.

Similarly, the result also shows that gross domestic product has a positive relationship with total loan to total deposit. It indicates that increase in gross domestic product leads to increase in total loan to total deposit. On the other hand, there is a negative relationship between inflation rate and total loan to total deposit. It indicates that increase in inflation rate leads to decrease in total loan to total deposit. In addition, money supply is positively related to total loan to total deposit. It shows that increase in money supply leads to increase in total loan to total deposit. Furthermore, there is a positive relationship between exchange rate and total loan to total deposit. It indicates that increase in exchange rate leads to increase in total loan to total deposit. Besides, interest rate has a negative relationship with total loan to total deposit. It means that increase in interest rate leads to decrease in total loan to total deposit. However, there is a

positive relationship between unemployment rate and total loan to total deposit. It means that increase in unemployment rate leads to increase in total loan to total deposit in Nepalese commercial banks.

## 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 gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate with total loan to total asset of Nepalese commercial banks.

**Table 4:** Estimated regression results of gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate on total loan to total assets of Nepalese commercial banks

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $TL/TA = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 EXR + \beta_4 IR + \beta_5 MS + \beta_6 UMR + \epsilon$ , where, the dependent variable is TL/TA (Total loan to total assets as measured by the ratio of total loan to total asset, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), IR (Interest rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UMR (Annual unemployment rate, in percentage).

| S. N.                               | Name of the banks                     | Study period      | Observations |
|-------------------------------------|---------------------------------------|-------------------|--------------|
| <b>Public banks</b>                 |                                       |                   |              |
| 1                                   | Nepal Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 2                                   | Agricultural Development Bank Limited | 2013/14 - 2020/21 | 8            |
| <b>Joint venture banks</b>          |                                       |                   |              |
| 3                                   | Nabil Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 4                                   | NMB Bank Limited                      | 2013/14 - 2020/21 | 8            |
| 5                                   | Everest Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 6                                   | Himalayan Bank Limited                | 2013/14 - 2020/21 | 8            |
| <b>Private banks</b>                |                                       |                   |              |
| 7                                   | NIC Asia Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 8                                   | Global IME Bank Limited               | 2013/14 - 2020/21 | 8            |
| 9                                   | Prime Commercial Bank Limited         | 2013/14 - 2020/21 | 8            |
| 10                                  | Nepal Investment Bank Limited         | 2013/14 - 2020/21 | 8            |
| 11                                  | Siddhartha Bank Limited               | 2013/14 - 2020/21 | 8            |
| 12                                  | Mega Bank Nepal Limited               | 2013/14 - 2020/21 | 8            |
| 13                                  | Prabhu Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 14                                  | Kumari Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 15                                  | Sanima Bank Limited                   | 2013/14 - 2020/21 | 8            |
| 16                                  | Citizens Bank International Limited   | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                       |                   | <b>128</b>   |

### 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 loan to total asset is the dependent variable.

Table 4 shows that the beta coefficients for gross domestic product are positive with total loan to total asset. It indicates that gross domestic product has a positive impact on total loan to total asset. This finding is similar to the findings of Diriba (2020). The beta coefficients for money supply are positive with total loan to total asset. It indicates that money supply has a positive impact on total loan to total asset. This finding is similar to the findings of Salmanov et al. (2015). Similarly, the beta coefficients for exchange rate are positive with total loan to total asset. It indicates that exchange rate has a positive impact on total loan to total asset. This finding is similar to the findings of Nkwoma (2014). Likewise, the beta coefficients for unemployment rate are positive with total loan to total asset. It indicates that unemployment rate has a positive impact on total loan to total asset. This finding is consistent with the findings of Albertazzi et al. (2016). On the other hand, the beta coefficients for inflation rate are negative with total loan to total asset. It indicates that inflation rate has a negative impact on total loan to total asset. This finding is similar to the findings of Ziramba (2008). Similarly, the beta coefficients for interest rate are negative with total loan to total asset. It indicates that interest rate has a negative impact on total loan to total asset. This finding is consistent with the findings of Michael (2020).

Table 5 shows the estimated regression results of gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate on total loan to total deposit of Nepalese commercial banks.

**Table 5:** Estimated regression results of gross domestic product, inflation rate, money supply, exchange rate, interest rate and unemployment rate on total loan to total deposit of Nepalese commercial banks

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $TL/TD = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 EXR + \beta_4 IR + \beta_5 MS + \beta_6 UMR + \epsilon$ , where, the dependent variable is TL/TD (Total loan to total deposit as measured by the ratio of total loan to total deposit, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), INF (Inflation rate as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), IR (Interest rate as measured by the lending cost of the bank, in percentage), MS (Money supply as measured by the broad money, USD in billion) and UMR (Annual unemployment rate, in percentage).

| Model | Intercept            | Regression coefficients of |                     |                   |                    |                    |                  | Ad. R_bar <sup>2</sup> | SEE   | F-value |
|-------|----------------------|----------------------------|---------------------|-------------------|--------------------|--------------------|------------------|------------------------|-------|---------|
|       |                      | GDP                        | INF                 | MS                | EXR                | IR                 | UMR              |                        |       |         |
| 1     | 59.841<br>(26.085)** | 0.308<br>(3.944)**         |                     |                   |                    |                    |                  | 0.103                  | 4.990 | 15.552  |
| 2     | 72.949<br>(55.422)** |                            | -0.688<br>(3.417)** |                   |                    |                    |                  | 0.078                  | 5.059 | 11.678  |
| 3     | 62.892<br>(24.287)** |                            |                     | 0.059<br>(2.286)* |                    |                    |                  | 0.032                  | 5.182 | 5.227   |
| 4     | 48.502<br>(6.848)**  |                            |                     |                   | 0.188<br>(2.860)** |                    |                  | 0.054                  | 5.125 | 8.180   |
| 5     | 75.898<br>(26.742)** |                            |                     |                   |                    | -1.074<br>(2.563)* |                  | 0.042                  | 5.156 | 6.568   |
| 6     | 63.793<br>(23.068)** |                            |                     |                   |                    |                    | 1.589<br>(1.806) | 0.018                  | 5.222 | 3.263   |
| 7     | 60.745<br>(23.508)** | 0.373<br>(3.235)**         |                     | 0.028<br>(0.765)  |                    |                    |                  | 0.100                  | 4.998 | 8.043   |
| 8     | 62.705<br>(11.169)** | 0.326<br>(1.961)           | -0.133<br>(0.394)   | 0.026<br>(0.697)  |                    |                    |                  | 0.094                  | 5.015 | 5.377   |
| 9     | 63.485<br>(14.423)** | 0.337<br>(1.330)           | -0.120<br>(0.298)   | 0.023<br>(0.353)  | 0.014<br>(0.059)   |                    |                  | 0.086                  | 5.035 | 4.002   |
| 10    | 64.993<br>(1.287)    | 0.521<br>(1.782)           | -0.182<br>(0.387)   | 0.130<br>(0.868)  | 0.046<br>(0.149)   | -0.497<br>(0.181)  | 2.800<br>(1.184) | 0.085                  | 5.040 | 2.962   |

**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. Total loan to total deposit is the dependent variable.

Table 5 shows that the beta coefficients for gross domestic product are positive with total loan to total deposit. It indicates that gross domestic product has a positive impact on total loan to total deposit. This finding is similar to the findings of John (2014). The beta coefficients for money supply are positive with total loan to total deposit. It indicates that money supply has a positive impact on total loan to total deposit. This finding is similar to the findings of Alkhazaleh (2017). Similarly, the beta coefficients for exchange rate are positive with total loan to total deposit. It indicates that exchange rate has a positive impact on total loan to total deposit. This finding is similar to the findings of Onaolapo and Habeeb (2017). Likewise, the beta coefficients for unemployment rate are positive with total loan to total deposit. It indicates that unemployment rate has a positive impact on total loan to total deposit. This finding is consistent with the findings of Louzis et al. (2012). On the other hand, the beta coefficients for inflation rate are negative with total loan to total deposit. It indicates that inflation rate has a negative impact on total loan to total deposit. This finding is similar to the findings of Ziramba (2008). Similarly, the beta coefficients for interest rate are negative with total loan to total deposit. It indicates that interest rate has a negative impact on total loan to total deposit. This finding is consistent with the findings of Akinlo and Oni (2015).

## 4. Summary and conclusion

Commercial banks are the most important savings, mobilization and financial resource allocation institutions. The main role of banks in economy is as an intermediary institution between parties with a surplus and those with a deficit of funds. The banks issue debts and loans to the creditors to capitalize their intermediation activities. These transactions of course pose great risk for the banks because of the likelihood that the creditors may default due to uncertain condition of the economy. This occurs when there are fluctuations in certain macroeconomic factors in the economy. Consequently, instability in these economic factors alters the lending behavior of financial institution in both short run and long run.

This study attempts to analyse the impact of macro-economic factors on the lending behaviour of Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study showed that gross domestic product, money supply, exchange rate and unemployment rate have positive impact on total loan to total asset. However, inflation rate and interest rate have negative impact on total loan to total asset. Likewise, gross domestic product, money supply, exchange rate and unemployment rate have positive impact on total loan to total deposit. However, inflation rate and interest rate have negative impact on total loan to total deposit. Likewise, the study also concluded that gross domestic product followed by inflation rate is the most influencing factor that explains the changes in the total loan to total asset of Nepalese commercial banks. Similarly, the study also concluded that gross domestic product followed by exchange rate is the most influencing factor that explains the changes in the total loan to total deposit in context of Nepalese commercial banks.

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## Abstract

*This study examines the impact of earnings management on the performance of Nepalese commercial banks. Return on asset and return on equity are selected as the dependent variables. Similarly, capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 128 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of earnings management on the performance of Nepalese commercial banks.*

*The study showed that earnings per share has a positive impact on return on asset and return on equity. It states that increase in earnings per share leads to increase in return on asset and return on equity. In addition, the study showed that net interest margin has a positive impact on return on asset and return on equity. It indicates that higher the net interest margin, higher would be the return on asset and return on equity. However, the study showed that cash reserve ratio has a positive impact on return on asset and return on equity. It reveals that higher the cash reserve ratio, higher would be the return on asset and return on equity. Furthermore, cash flow from operating activities has a positive impact on return on asset and return on equity. It leads that increase in cash flow from operating activities leads to increase in the return on asset and return on equity. Moreover, credit to deposit ratio has a negative impact on return on asset and return on equity. It indicates that increase in credit to deposit ratio leads to decrease in return on asset and return on equity. The study also showed that capital adequacy ratio has a negative impact on return on asset and return on equity. It reveals that higher the capital adequacy ratio, lower would be the return on asset and return on equity.*

**Key words:** Return on asset, return on equity, capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio and earning per share.

# 1. Introduction

The company's performance is measured through the capability of resulting earnings. Hence, a firm will put an effort to increase performance by obtaining a high amount of earnings. A high amount of earnings obtained by the firm is more attractive for investors than a firm with low earnings (Purwanti and Natser, 2016). Dealing with fierce competition, a firm takes several efforts to earn a high amount of earnings for increasing the firm value. The use of a financial statement only focuses on earnings information regardless of how the earnings are obtained. The high amount of earnings illustrates the company's effort in increasing the firm value. To increase or show high earnings, companies perform earnings management (Al-Absy et al., 2020). Earnings management is a practice followed by the management of a company to influence the earnings reported in financial statements. Companies use earnings management to smooth out fluctuations in earnings and present more consistent profits each month, quarter, or year (Hernawati et al., 2021). Earnings management occurs when managers within organisations use accounting methods and techniques to present a distort number of their company's earnings (Beneish, 2001). Earnings management serves the interests of managers at the expense of stakeholders. This is because the inaccurate earnings reported by managers inform the investment and lending decisions made by key personnel inside and outside the organisation. Gill et al. (2013) stated that firms' earnings management is more common in weak rule-of-law countries than in companies operating in locations where the rule of law is strong. Earnings management is the alteration of a firm's reported economic performance by insiders in order to either mislead some stakeholders or to influence contractual outcomes. Earnings management is the practice of managerial actions that are reflected in a company's financial reports either to give the impression of smooth periodic or annual earnings and to show high profits in a given year.

The profitability of banking sector not only contributes in economies but also helps to maintain the stability of the financial system and enable economies to endure the external and negative financial shocks. Tabassum et al. (2015) investigated the relationship between earning management and firm's future performance. The study found that there is a positive relationship between earning management and firm performance. Banks use more earning management through spending more in order to get better outcome (Ahmed et al., 1999). However, Ardekani et al. (2012) showed that earnings management activities are negatively correlated to firm's financial performance. However, there is mixed evidence regarding the relationship between firm performance and earnings management (Gill et al., 2013). Abbas (2018) investigated earnings management through discretionary accruals in pre and post period of convergence of IFRS. The study showed a positive and significant impact of earnings management on firm performance. Similarly, Ado et al. (2020) examined the impact of earnings management on bank performance in the Nigeria. The study revealed that earnings ability has a significant and positive relationship with the profitability. Bourke (1989) examined the determinants of banks' performance from 2004-05 to 2015-16. The results found that there is a significant positive relation between capital adequacy and profitability. In addition, the study concluded that the higher the capital ratio is, the more profitable the bank will be.

Martani et al. (2009) investigated the effect of financial ratios, firm size, and cash flow from operating activities in the interim report to the stock return. The study found that bank size cannot be considered a positive contributor to profitability. Malik et al. (2016) investigated the effects of operating cash flows attributable to net income and the effect of operating cash flows attributable to sales on the earnings per share. The study showed a significant effect of the operating cash flows attributable to net income on earnings per share, while there is no significant effect on operating cash flows attributable to sales on earnings per share. The study concluded that profitability, turnover and market ratio have a significant

impact on the stock return. Furthermore, Sufian and Chong (2008) examined the determinants of Philippine bank profitability during the period 1990–2005. The study found that all the bank-specific determinant variables have a statistically significant impact on bank profitability. The empirical findings suggested that size, credit risk, and expense preference behavior are negatively related to profitability, while non-interest income and capitalization have a positive impact on bank profitability. Pouraghajan et al. (2013) examined the effects of operating cash flows and the size of the company on the earnings per share of 140 companies listed on Tehran Stock Exchange during the period 2006–2010. The results indicated a positive and significant relationship of financial ratios and firm size with earnings per share. The study also found that there is no significant effect of operating cash flows on earnings per share.

Udeh (2015) examined the impact of monetary policy instruments on profitability of commercial banks in Nigeria using the Zenith Bank Plc. The study discovered that cash reserve ratio, liquidity ratio and interest rate have significant negative impact on the profit before tax of Zenith Bank Plc. In addition, Rao (2006) carried out a study on the impact of monetary policy on the profitability of banks in India between 1995 and 2000. The study revealed that bank rate, cash reserve system and statutory ratio have negative and significant effect on the profitability of banks. Further, Chortareas et al. (2012) found positive relation between capital adequacy and the financial performance of commercial banks. In addition, Epure and Lafuente (2012) showed that capital adequacy ratio has a positive impact on the net interest margin. Carrera (2013) also revealed that cash reserve ratio has positive impact on financial performance. Moreover, Uremadu (2012) found that increase in CRR leads to increase the bank profitability.

In the context of Nepal, Tiwari et al. (2022) assessed the effect of financial ratios, firm size and cash flow from operating activities on the profitability of Nepalese commercial banks. The study showed that liquidity and CAR have positive impact on return on assets of Nepalese commercial banks. Similarly, firm size, cash flow from operating activities, liquidity and leverage have positive impact on return on equity. However, firm size, cash flow from operating activities, leverage and non-performing loans have negative impact on return on assets. Similarly, CAR and non-performing loan have negative impact on return on equity. Similarly, Humagain et al. (2022) examined the impact of internal and external factors on the profitability of Nepalese commercial banks. The study also showed that equity to total assets has a positive impact on return on assets and return on equity. Furthermore, total loan to total assets ratio has a positive impact on return on assets and return on equity. It indicates that the increase in total loan to total assets ratio leads to increase in return on assets and return on equity. Moreover, Karn et al. (2022) analyzed the impact of monetary policy on the profitability of Nepalese commercial banks. The study showed that statutory liquidity ratio, capital adequacy ratio and bank rate have positive impact on the return on assets. However, cash reserve ratio, money supply and exchange rate have negative impact on the return on assets. Similarly, statutory liquidity ratio and bank rate have positive impact on return on equity. The study also showed that cash reserve ratio, capital adequacy ratio, money supply and exchange rate have negative impact on return on equity. Furthermore, Maharjan et al. (2016) examined the relationship between credit risk, liquidity and profitability in Nepalese commercial banks. The study revealed that total debt to equity and loan to deposit is negatively related with return on assets.

The above discussion shows that empirical evidences vary greatly across the studies concerning the impact of earning management on bank 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 main purpose of the study is to analyse the impact of earning management on bank performance in the context of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy

ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities with return on asset 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 the conclusion.

## 2. Methodological aspects

The study is based on secondary data which were gathered from 16 commercial banks from 2013/14 to 2020/21, leading to a total of 135 observations. The study used stratified sampling method to select the banks. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|-------------------------------------|-------------------------------------|-------------------|--------------|
| <b>Public banks</b>                 |                                     |                   |              |
| 1                                   | Rastriya Banijya Bank Limited       | 2013/14 - 2020/21 | 8            |
| 2                                   | Nepal Bank Limited                  | 2013/14 - 2020/21 | 8            |
| <b>Joint venture banks</b>          |                                     |                   |              |
| 3                                   | Nabil Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 4                                   | NMB Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 5                                   | Himalayan Bank Limited              | 2013/14 - 2020/21 | 8            |
| 6                                   | Everest Bank Limited                | 2013/14 - 2020/21 | 8            |
| <b>Private banks</b>                |                                     |                   |              |
| 7                                   | NIC Asia Bank Limited               | 2013/14 - 2020/21 | 8            |
| 8                                   | Global IME Bank Limited             | 2013/14 - 2020/21 | 8            |
| 9                                   | Siddhartha Bank Limited             | 2013/14 - 2020/21 | 8            |
| 10                                  | Nepal Investment Bank Limited       | 2013/14 - 2020/21 | 8            |
| 11                                  | Prabhu Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 12                                  | Kumari Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 13                                  | Prime Commercial Bank Limited       | 2013/14 - 2020/21 | 8            |
| 14                                  | Sanima Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 15                                  | Mega Bank Nepal Limited             | 2013/14 - 2020/21 | 8            |
| 16                                  | Citizens Bank International Limited | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                     |                   | <b>128</b>   |

Thus, the study is based on the 128 observations.

## The model

The model used in this study assumes that bank performance depends upon the earning management of the banks. The dependent variables selected for the study are return on asset and return on equity. Similarly, the selected independent variables are capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities. Therefore, the model takes the following form:

Bank performance =  $f$  (CAR, NIM, CD, CRR, EPS and CFO)

More specifically, the given model has been segmented into following models:

$$ROA = \beta_0 + \beta_1 \text{EPS} + \beta_2 \text{CAR} + \beta_3 \text{NIM} + \beta_4 \text{CD} + \beta_5 \text{CRR} + \beta_6 \text{CFO} + e_{it}$$

$$ROE = \beta_0 + \beta_1 \text{EPS} + \beta_2 \text{CAR} + \beta_3 \text{NIM} + \beta_4 \text{CD} + \beta_5 \text{CRR} + \beta_6 \text{CFO} + e_{it}$$

Where,

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 shareholders equity, in percentage.

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

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

CRR = Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage.

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

CFO = Cash flow from operating activities as measured by the ratio of amount of cash flow operation to current liabilities, in percentage.

EPS = Earnings per share as measured by the ratio of net income to outstanding common share, in Rs.

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

## Capital adequacy ratio

Capital adequacy ratio for banks is one of the most important indicators of the financial solvency of the financial sector. According to Almazari and Alamri (2017), capital adequacy denotes the ability and competence of a firm to determine how well it addresses the risks it is faced with. Agbeja et al. (2019) examined whether or not capital adequacy ratio affects bank profitability. The study found that capital adequacy ratio has a positive and significant relationship with bank profitability. Jadhav et al. (2021) found that capital adequacy ratio has a positive impact on profitability. Similarly, Iftikhar (2016) found that capital adequacy ratio has a positive and significant impact on financial performance. Likewise, Asikhia and Sokefun (2013) showed a positive and significant relationship between capital adequacy and profitability of bank. Moreover, Daoud and Kammoun (2020) found that capital adequacy ratio has a positive effect on financial stability. Furthermore, Sayilgan and Yildirim (2009) found that capital adequacy ratio positively influences the profitability of banks. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between capital adequacy ratio and bank performance.

## Net interest margin

Net interest margin serves as an indicator of performance, more specifically, efficiency of the banking industry (Sensarma and Ghosh, 2004). Too high NIM is reflective of lack of competition in the industry.

However, too low NIM can also put a stress on the profitability of banks. Boateng (2018) found that net interest margin has a positive and significant effect on bank profitability. Musah et al. (2018) found that net interest margin has a positive and significant impact on ROA and ROE. Likewise, Supriyono and Herdhayinta (2019) analyzed the determinants of profitability of the regional development bank in Indonesia. The study found that net interest margin has a significant positive relationship with profitability. Similarly, Setiawan and Hermanto (2017) found that net interest margin has a positive and significant effect on profitability. Moreover, Sari and Endri (2019) found that net interest margin has a positive and significant impact on return on assets. In addition, Buchory (2016) found that net interest margin has positive but not significant effect on return on assets. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between net interest margin and bank performance.

## Credit to deposit ratio

Low credit to deposit ratio indicates a low level of credit expansion compared to the funds it receives and indicates that banks are still far from being maximized in carrying out their intermediation function (Mulyono, 2001). Chowdhury and Zaman (2018) analyzed the effect of liquidity risk on the Islamic bank's performance. The study found that credit to deposit ratio has a negative relationship with return on assets and return on equity. Likewise, Moreover, Ramchandani and Jethwani (2017) found that credit to deposit ratio has a negative association with bank profitability. Similarly, Shafana (2015) found that credit to deposit ratio has a significant negative effect on profitability of financial institutions. Bolek and Wilinski (2012) found that credit to deposit ratio has a negative impact on firm profitability. Furthermore, Malik et al. (2016) found that credit to deposit ratio has a negative association with profitability. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a negative relationship between credit to deposit and bank performance.

## Cash reserve ratio

Reserve requirement ratio is one of the tools of monetary policy used to control money supply in the economy. Hoque et al. (2020) examined the impact of monetary policy on bank's profitability. The study found that cash reserve ratio has negative relationship with profitability. Abidi and Lodhi (2015) found that cash reserve ratio has a significant negative relationship with bank profitability. Similarly, Olagunju and Isiaka (2021) found that cash reserve requirement has a negative and significant relationship with profitability of banks. Moreover, Tamunosiki et al. (2017) found that cash reserve ratio has a negative and significant relationship between with corporate performance. Likewise, Gray (2011) found that reserve requirement has a negative influence on banks' financial performance. Almazari (2013) found that cash reserve ratio has negative relationships with the profitability of the banks. However, Oudat and Ali (2020) investigated the impact of cash reserve requirement on the profitability of deposit money banks. The study found that cash reserve has a positive and significant relationship with the bank profitability. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is negative relationship between cash reserve ratio and bank performance.

## Earnings per share

Earnings per share (EPS) is the benchmark used to measure firm's profitability (Slavin, 2007). Ohlson (1995) considered earnings per share as an important variable for measurement of financial performance. Soeindoen and Siagian (2021) determined the effect of leverage and earnings per share on profitability. The study found that earnings per share has a significant positive effect on profitability. In addition, Kalama (2013) found that earnings per share have a positive and significant relationship with share prices of firms. Similarly, Saeed and Tahir (2015) found that earnings per share has a strong relationship with bank profitability. Joana and Pitaloka (2017) found that earnings per share have a positive and significant impact on profitability. Moreover, Ulzanah and Murtaqi (2015) found that earnings per share has a positive significant relationship with bank profitability. Likewise, Zarezadeh et al. (2011) showed that earnings per share have a positive and significant relationship with return on assets and stock price of the company. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between earnings per share and bank performance.

## Cash flow from operating activities

Cash flow shows the inflows and outflows of cash and cash equivalents within an entity. According to Nwanyanwu (2015), there is a positive relationship between cash flows from operating, investing and financing activities and firm profitability. Ikechukwu et al. (2015) examined the effect of cash flow statement on company's profitability. The study found that cash-flow from operating activities has a positive and significant effect on company's profitability. In addition, Rahman and Sharma (2020) found that operating cash flows have a positive and significant association between financial performance (ROA and ROE). Similarly, Supatminingsih and Setyawati (2018) found that operating variables has positive but insignificant influence on financial performance. Likewise, Margaret (2018) found that operating cash flows has a positive and significant correlation with return on equity. Moreover, Vaklifard and Shahmoradi (2014) revealed that the relationship between profitability and operating cash flows has significantly positive. Furthermore, Adelegan (2017) found that the relationship between operating cash flow and firm performance are positive. Frank and James (2014) found a significant positive relationship between operating cash flows and corporate performance. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is positive relationship between cash flow from operating activities and bank performance.

## 3. Results and discussion

### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.



**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets ratio, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CD (Credit to deposit ratio as measured by the ratio of loans to deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), EPS (Earnings per share as measured by the ratio of net income to outstanding common share, in Rs) and CFO (Cash flow from operating activities as measured by the ratio of amount of cash flow operation to current liabilities, Rs in million).

| Variables | Minimum   | Maximum  | Mean    | S. D.   |
|-----------|-----------|----------|---------|---------|
| ROA       | 0.55      | 2.89     | 1.62    | 0.45    |
| ROE       | 7.57      | 55.31    | 18.00   | 6.49    |
| CAR       | 4.55      | 17.91    | 12.84   | 1.95    |
| NIM       | 1.87      | 5.09     | 3.11    | 0.54    |
| CD        | 49.45     | 96.69    | 81.42   | 8.83    |
| CRR       | 3.05      | 28.91    | 10.64   | 6.29    |
| EPS       | -15.24    | 86.04    | 27.47   | 14.24   |
| CFO       | -10726.52 | 32805.30 | 3480.85 | 5335.67 |

## 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 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets ratio, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CD (Credit to deposit ratio as measured by the ratio of loans to deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), EPS (Earnings per share as measured by the ratio of net income to outstanding common share, in Rs) and CFO (Cash flow from operating activities as measured by the ratio of amount of cash flow operation to current liabilities, Rs in million).

| Variables | ROA     | ROE      | CAR      | NIM      | CD       | CRR    | EPS   | CFO |
|-----------|---------|----------|----------|----------|----------|--------|-------|-----|
| ROA       | 1       |          |          |          |          |        |       |     |
| ROE       | 0.443** | 1        |          |          |          |        |       |     |
| CAR       | -0.032  | -0.396** | 1        |          |          |        |       |     |
| NIM       | 0.519** | 0.238**  | -0.183*  | 1        |          |        |       |     |
| CD        | -0.199* | -0.382** | 0.425**  | -0.287** | 1        |        |       |     |
| CRR       | 0.112   | 0.324**  | -0.262** | 0.031    | -0.264** | 1      |       |     |
| EPS       | 0.588** | 0.513**  | -0.181*  | 0.406**  | -0.341** | 0.217* | 1     |     |
| CFO       | 0.090   | 0.040    | -0.076   | -0.034   | 0.035    | 0.097  | 0.129 | 1   |

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

Table 3 shows that credit to deposit ratio is negatively correlated to return on asset. It indicates that increase in credit to deposit ratio leads to decrease in return on asset. The study also shows that capital



adequacy ratio has a negative relationship with return on asset. It reveals that higher the capital adequacy ratio, lower would be the return on asset. In addition, the study shows that net interest margin is positively correlated to return on asset. It indicates that higher the net interest margin, higher would be the return on asset. However, the study shows that cash reserve ratio has a positive relationship with return on asset. It reveals that higher the cash reserve ratio, higher would be the return on asset. Earnings per share has a positive relationship with return on asset. It states that increase in earnings per share leads to increase in return on asset. Furthermore, cash flow from operating activities has a positive relationship with return on asset. It leads that increase in cash flow from operating activities leads to increase in the return on asset.

On the other hand, capital adequacy ratio has a negative relationship with return on equity. It reveals that higher the capital adequacy ratio, lower would be the return on equity. In addition, the study shows that net interest margin is positively correlated to return on equity. It indicates that higher the net interest margin, higher would be the return on equity. However, the study shows that cash reserve ratio has a positive relationship with return on equity. It reveals that higher the cash reserve ratio, higher would be the return on equity. Earnings per share has a positive relationship with return on equity. It states that increase in earnings per share leads to increase in return on equity. Furthermore, cash flow from operating activities has a positive relationship with return on equity. It leads that increase in cash flow from operating activities leads to increase in return on equity. The study shows that credit to deposit ratio is negatively correlated to return on equity. It indicates that increase in credit 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, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities with return on asset of Nepalese commercial banks.

**Table 4:** Estimated regression results of capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities with return on asset

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $ROA = \beta_0 + \beta_1 EPS + \beta_2 CAR + \beta_3 NIM + \beta_4 CD + \beta_5 CRR + \beta_6 CFO + \epsilon$ , where the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets ratio, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CD (Credit to deposit ratio as measured by the ratio of loans to deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), EPS (Earnings per share as measured by the ratio of net income to outstanding common share, in Rs) and CFO (Cash flow from operating activities as measured by the ratio of amount of cash flow operation to current liabilities, Rs in million).

| Model | Intercept           | Regression coefficients of |                    |                    |                  |                    |                  | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|--------------------|--------------------|------------------|--------------------|------------------|------------------------------------|-------|---------|
|       |                     | CAR                        | NIM                | CD                 | CRR              | EPS                | CFO              |                                    |       |         |
| 1     | 1.723<br>(6.385)**  | -0.007<br>(0.358)          |                    |                    |                  |                    |                  | 0.007                              | 0.458 | 0.128   |
| 2     | 0.277<br>(1.373)    |                            | 0.435<br>(6.808)** |                    |                  |                    |                  | 0.263                              | 0.392 | 46.345  |
| 3     | 2.464<br>(6.663)**  |                            |                    | -0.010<br>(2.274)* |                  |                    |                  | 0.032                              | 0.449 | 5.173   |
| 4     | 1.533<br>(16.813)** |                            |                    |                    | 0.008<br>(1.150) |                    |                  | 0.003                              | 0.479 | 1.323   |
| 5     | 1.110<br>(15.551)** |                            |                    |                    |                  | 0.019<br>(8.159)** |                  | 0.340                              | 0.371 | 66.570  |
| 6     | 1.543<br>(16.651)** |                            |                    |                    |                  |                    | 0.011<br>(1.019) | 0.000                              | 0.456 | 1.038   |
| 7     | 0.050<br>(0.149)    | -0.015<br>(0.841)          | 0.445<br>(6.839)** |                    |                  |                    |                  | 0.261                              | 0.392 | 23.472  |
| 8     | 2.433<br>(5.483)**  |                            |                    | -0.011<br>(2.070)* | 0.004<br>(0.579) |                    |                  | 0.033                              | 0.471 | 2.826   |
| 9     | 1.098<br>(11.724)** |                            |                    |                    |                  | 0.019<br>(8.034)** | 0.002<br>(0.203) | 0.335                              | 0.372 | 33.052  |
| 10    | 0.397<br>(0.863)    | -0.024<br>(1.211)          | 0.427<br>(6.394)** | -0.005<br>(1.107)  |                  |                    |                  | 0.263                              | 0.392 | 16.085  |
| 11    | 1.102<br>(9.951)**  |                            |                    |                    | 0.001<br>(0.233) | 0.019<br>(7.259)** | 0.002<br>(0.198) | 0.334                              | 0.391 | 18.693  |
| 12    | 0.181<br>(0.328)    | -0.028<br>(1.308)          | 0.429<br>(5.731)** | -0.004<br>(0.818)  | 0.008<br>(1.213) |                    |                  | 0.260                              | 0.412 | 10.293  |
| 13    | -0.086<br>(0.176)   | -0.029<br>(1.506)          | 0.287<br>(4.042)** | -0.001<br>(0.036)  | 0.003<br>(0.427) | 0.015<br>(5.477)** |                  | 0.424                              | 0.364 | 16.576  |
| 14    | -0.128<br>(0.259)   | -0.030<br>(1.557)          | 0.291<br>(4.079)** | -0.001<br>(0.028)  | 0.002<br>(0.384) | 0.014<br>(5.257)** | 0.007<br>(0.708) | 0.421                              | 0.365 | 13.828  |

**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 asset is the dependent variable.

Table 4 shows that the beta coefficients for net interest margin share are positive with return on asset. It indicates that net interest margin has a positive impact on return on asset. This finding is consistent with the findings of Buchory (2016). Likewise, the beta coefficients of earnings per share are positive with return on asset. It indicates that earnings per share have a positive impact on return on equity. This finding

is similar to the findings of Zarezadeh et al. (2011). Moreover, the beta coefficients of cash flow from operating activities are positive with return on asset. It indicates that cash flow from operating activities has a positive impact on return on asset. This finding is consistent with the findings of Frank and James (2014). The beta coefficients for credit to deposit ratio are negative with return on asset. It indicates that credit to deposit ratio have a negative impact on return on asset. This finding is inconsistent with findings of Bolek and Wilinski (2012). However, the beta coefficients for cash reserve ratio are positive with return on asset. It indicates that cash reserve ratio has a positive impact on return on asset. This finding contradicts with the findings of Almazari (2013).

Table 5 shows the estimated regression results of capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities with return on equity of Nepalese commercial banks.

**Table 5:** Estimated regression results of capital adequacy ratio, net interest margin, credit to deposit ratio, cash reserve ratio, earning per share and cash flow from operating activities with return on equity

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $ROE = \beta_0 + \beta_1 EPS + \beta_2 CAR + \beta_3 NIM + \beta_4 CD + \beta_5 CRR + \beta_6 CFO + \epsilon$ , where the dependent variable is ROE (Return on equity as measured by the ratio of net profit to total shareholders' equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets ratio, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CD (Credit to deposit ratio as measured by the ratio of loans to deposits, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage), EPS (Earnings per share as measured by the ratio of net income to outstanding common share, in Rs) and CFO (Cash flow from operating activities as measured by the ratio of amount of cash flow operation to current liabilities, Rs in million).

| Model | Intercept            | Regression coefficients of |                    |                     |                    |                    |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|----------------------|----------------------------|--------------------|---------------------|--------------------|--------------------|------------------|-------------------------|-------|---------|
|       |                      | CAR                        | NIM                | CD                  | CRR                | EPS                | CFO              |                         |       |         |
| 1     | 34.878<br>(9.885)**  | -1.315<br>(4.838)**        |                    |                     |                    |                    |                  | 0.150                   | 5.989 | 23.407  |
| 2     | 9.179<br>(2.819)**   |                            | 2.839<br>(2.750)** |                     |                    |                    |                  | 0.049                   | 6.335 | 7.562   |
| 3     | 40.905<br>(8.247)**  |                            |                    | -0.281<br>(4.644)** |                    |                    |                  | 0.139                   | 6.027 | 21.571  |
| 4     | 14.332<br>(11.311)** |                            |                    |                     | 0.360<br>(3.510)** |                    |                  | 0.097                   | 6.649 | 12.323  |
| 5     | 11.578<br>(10.740)** |                            |                    |                     |                    | 0.234<br>(6.705)** |                  | 0.257                   | 5.599 | 44.972  |
| 6     | 17.466<br>(13.205)** |                            |                    |                     |                    |                    | 0.069<br>(0.449) | 0.002                   | 6.517 | 0.202   |
| 7     | 27.193<br>(5.363)**  | -1.210<br>(4.437)**        | 2.043<br>(2.085)*  |                     |                    |                    |                  | 0.172                   | 5.912 | 14.188  |
| 8     | 36.090<br>(6.114)**  |                            |                    | -0.257<br>(3.764)** | 0.261<br>(2.597)*  |                    |                  | 0.197                   | 6.268 | 14.017  |
| 9     | 11.891<br>(8.410)    |                            |                    |                     |                    | 0.235<br>(6.671)** | 0.046<br>(0.344) | 0.252                   | 5.619 | 22.388  |
| 10    | 39.051<br>(5.759)**  | -0.914<br>(3.151)**        | 1.449<br>(1.469)   | -0.169<br>(2.565)*  |                    |                    |                  | 0.207                   | 5.784 | 12.074  |
| 11    | 10.095<br>(6.040)**  |                            |                    |                     | 0.253<br>(2.703)*  | 0.212<br>(5.491)** | 0.078<br>(0.532) | 0.288                   | 5.904 | 15.277  |
| 12    | 33.457<br>(4.107)**  | -0.797<br>(2.482)*         | 1.520<br>(1.379)   | -0.151<br>(2.001)*  | 0.228<br>(2.304)*  |                    |                  | 0.244                   | 6.081 | 9.570   |
| 13    | 30.149<br>(4.001)    | -0.791<br>(2.678)**        | 0.236<br>(0.216)   | -0.098<br>(1.378)   | 0.159<br>(1.722)   | 0.180<br>(4.402)** |                  | 0.360                   | 5.598 | 12.911  |
| 14    | 30.676<br>(4.028)    | -0.805<br>(2.708)**        | 0.293<br>(0.266)   | -0.094<br>(1.316)   | 0.162<br>(1.747)   | 0.184<br>(4.421)** | 0.082<br>(0.578) | 0.355                   | 5.616 | 10.744  |

**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 is the dependent variable.

Table 5 shows that the beta coefficients for net interest margin share are positive with return on equity. It indicates that net interest margin has a positive impact on return on equity. This finding is consistent with the findings of Supriyono and Herdhayinta (2019). Likewise, the beta coefficients of earnings per share are positive with return on equity. It indicates that earnings per share have a positive impact on return on equity. This finding is similar to the findings of Soeindoen and Siagian (2021). Moreover, the beta coefficients of cash flow from operating activities are positive with return on equity. It indicates that cash flow from operating activities has a positive impact on return on equity. This finding is consistent with the findings of Vaklifard and Shahmoradi (2014). The beta coefficients for credit to deposit ratio are negative with return on equity. It indicates that credit to deposit ratio have a negative impact on return on equity. This finding is inconsistent with the findings of Chowdhury and Zaman (2018). However, the beta coefficients for cash reserve ratio are positive with return on equity. It indicates that cash reserve ratio has a positive impact on return on equity. This finding contradicts with the findings of Hoque et al. (2020).

## 4. Summary and conclusion

Earnings management is defined as a tools or process that is used in accordance with constraints of generally accepted accounting principles by insiders to manipulate earnings or to alter the reported number against the interest of outsiders. Earnings management is efficiency, where it is done to increase the value of the company and one of them is by increasing persistence earnings, the profitability of the company in the future, or the quality of profit. Furthermore, managers use earnings management to manipulate financial reported figures and this practice affects economic performance of the firm.

This study attempts to analyse the impact of earning management on the performance of Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study showed that net interest margin, cash reserve ratio, earning per share and cash flow from operating activities have positive impact on return on asset and return on equity. However, capital adequacy ratio and credit to deposit ratio have negative impact on return on asset and return on equity. Likewise, the study concluded that earnings per share followed by net interest margin is the most influencing factor that explains the changes in the return on assets of Nepalese commercial banks. Similarly, the study also concluded that earnings per share followed by capital adequacy ratio and credit to deposit ratio is the most influencing factor that explain the changes in the return on equity in context of Nepalese commercial banks.

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## Abstract

*This study examines the effects of macroeconomic indicators on the stability of the Nepalese financial system. Return on equity and Z-score are selected as the dependent variables. Similarly, inflation, money supply, unemployment rate, GDP growth rate, exchange rate and interest rate selected as the independent variables. This study is based on secondary data of 10 commercial banks and 7 development banks of Nepal with 102 observations for the period from 2015/16 to 2020/21. The data are collected from Banking and Financial Statistics published by Nepal Rastra Bank and annual reports of selected Nepalese commercial banks and development banks. The correlation coefficients and regression models are estimated to test the significance and importance of macroeconomic indicators on the stability of the Nepalese financial institutions.*

*The study showed that unemployment rate has a negative impact on return on equity and Z-score of Nepalese commercial banks. It indicates that increase in unemployment rate leads to decrease in return in equity and Z-score. Similarly, gross domestic product has a positive impact on return on equity and Z-score of Nepalese commercial banks. It indicates that increase in gross domestic product leads to increase in return on equity and Z-score. The result also showed that exchange rate has a negative impact on return on equity and Z-score of Nepalese commercial banks. It means higher the exchange rate, lower would be the return on equity and Z-score. Similarly, interest rate has a positive impact on return on equity. It indicates that increase in interest rate leads to increase the return on equity and Z-score. Likewise, inflation rate has a negative impact on Z-score. It indicates that increase in inflation rate leads to decrease in Z-score of Nepalese commercial banks. Furthermore, money supply has a positive impact on return on equity of Nepalese development banks. It means higher the money supply, higher would be the return on equity. The result also showed that unemployment rate has the negative impact on return on equity and Z-score of Nepalese development banks. It indicates that increase in unemployment rate leads to decrease in return in equity and Z-score. Similarly, gross domestic product has a positive impact on return on equity and Z-score of Nepalese development banks. It indicates that increase in gross domestic product leads to increase in return on equity and Z-score.*

**Key words:** Return on equity, Z-score, exchange rate, unemployment rate, interest rate, money supply, inflation rate.

# 1. Introduction

One of the most important factors influencing cohesive economic development of any country is effective performance and reliability of its banks. The evaluation of soundness and stability of the commercial banks and the stability of the financial system of a country are closely related (Miletic, 2009). Banks are the most important financial intermediaries in the most economies that provide a bundle of different services. As financial intermediaries, banks play a crucial role in the operation of most economies. The efficiency of financial intermediation can also affect economic growth. Besides, banks insolvencies can result in systemic crisis. Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou et al., 2008).

Microeconomic activities as well as macroeconomic activities of an economy largely depend on banking sector. Banking institutions are considered the lifeblood of any economy. The main role of a banking system is to assist the flow of funds from savers to borrowers. Banks are such types of business where deposits are considered as liabilities and issuing debt securities are considered as assets on the other part (Fama, 1980). According to Ongore (2013), the performance of commercial banks can be affected by internal and external factors which can be classified into bank specific (internal) and macroeconomic variables and the internal factors are individual bank characteristics which affect the bank's performance. These factors are basically influenced by the internal decisions of management and board. The external factors are sector wide or country wide factors which are beyond the control of the company and affect the profitability of banks.

Sufian and Chong (2008) examined the determinants of Philippines banks profitability during the period 1990–2005 by using the linear regression model. The empirical findings stated that size, credit risk, and expense preference behavior are negatively related to banks' profitability, while non-interest income and capitalization have a positive impact. The results also revealed that inflation has a negative impact on bank profitability, while the impact of economic growth, money supply, and stock market capitalization have not significantly explained the variations in the profitability of the Philippines banks. Guru et al. (2002) examined the determinants of bank performance using a sample of seventeen commercial banks from 1986-1995. The study concluded that efficient expenses management is one of the most significant explanatory variables of high bank profitability. Similarly, inflation is positively related to bank performance, while interest ratio has a negative relationship with bank performance. A profitable financial institution at micro level represents the availability of resources and funds, however, the macro factors such as gross domestic product (GDP), interest rate, inflation, money supply, competition and exchange rate may result in lack of resources and funds (Aburime, 2008). Shuremo (2016) examined the effect of bank-specific, industry-specific and macroeconomic determinants on banks' profitability in Ethiopia. The study found that GDP growth, interest rate and exchange rate have positive relationship with banks' profitability. Lelissa (2014) examined the determinants of Ethiopian banks performance from 1990 to 2012. The results indicated that macroeconomic variable i.e., real GDP has an insignificant impact on banks profitability, whereas inflation has a positive effect on profitability. However, Abate and Mesfin (2019) analyzed the effect of bank specific, industry-specific and macro-economic factors on banks profitability. The findings of the study showed that real GDP, inflation and interest rate have negative relationship with commercial banks' profitability.

Kaminsky and Reinhart (1999) confirmed that financial instability is positively associated with financial development. This implies that safeguarding financial stability and identifying vulnerabilities within a financial

system is essential for financial development. The competitiveness of each bank may vary according to the characteristics and distinctive advantages they possess. However, macroeconomic and financial conditions facing banks are the same when operating in the same economy. Conducive macro conditions can provide a positive environment to the development of banking itself. Conversely, macroeconomic and financial conditions that are less stable can affect market risk and the credit risk of banks, which in turn may have an impact on the bank's performance (Aviliani et al., 2015). Ongore et al. (2013) analyzed the determinants of financial performance of commercial banks in Kenya. The study revealed that macroeconomic variables have insignificant impact on the bank performance. However, Combey and Togbenou (2017) revealed that inflation, GDP growth and real effective exchange rate significantly influence the bank profitability in Togo. Carvallo and Pagliacci (2014) found that rising interest rate and domestic currency appreciation contributed to banking sector instability.

Noman et al. (2015) examined the effect of bank specific and macroeconomic factors on bank profitability in the context of Bangladesh. The study found a significant positive association between GDP growth and firm profitability. Bourke (1989) assessed the performance of banks in twelve countries of Europe, North America and Australia. The study confirmed positive growth rates have a positive influence on bank's profitability. Apart from growth rates, interest rate also influences bank's profitability. Bank's profitability tends to rise with increase in interest rates as a result of increased spread between borrowing and saving rates. Owoputi (2014) investigated the impact of bank-specific, industry-specific and macroeconomic indicators on bank profitability in Nigeria over the time period from 1998 to 2012, using random-effect model. The study showed a positive and significant effect of capital adequacy, bank size, productivity growth and deposits on profitability. Credit risk and liquidity ratio have a negative and significant effect on bank profits. However, inflation rate and interest rate are negatively and significantly related to bank profitability. Sufian and Habibullah (2009) examined the performance of 37 Bangladeshi commercial banks between 1997 and 2004. The study revealed that bank loans intensity, credit risk, and cost have positive and significant impacts on bank performance whereas bank size exhibits a negative impact on return on average equity (ROAE). Furthermore, the study also found that the impact of macroeconomic indicators and variables have no significant impact on bank profitability except inflation which has a negative relationship with Bangladeshi banks profitability. Jara-Bertin et al. (2014) investigated the determinants of bank performance in case of Latin America. The study found that inflation rate is positively and significantly associated with bank profitability.

In the context of Nepal, Humagain et al. (2022) analyzed the impact of internal and external factors on the profitability of Nepalese commercial banks. The study showed that inflation has negative impact on return on equity. However, interest rate, GDP growth rate, equity to total assets, total loan to total assets, and bank size have positive impact on return on equity. Likewise, interest rate and inflation have negative impact on return on assets. However, GDP growth rate, equity to total assets, total loan to total assets, and bank size have positive impact on return on assets. Similarly, Neupane (2020) examined the determinants of commercial bank profitability in Nepal. The study revealed that industry specific factors such as concentration and banking sector development have high degree of impact on return on assets whereas macroeconomic variables such as GDP growth, inflation rate and exchange rate have quite a weak degree but significant impact on profitability of Nepalese commercial banks. Manandhar et al. (2014) found that inflation and gross domestic product are positively related to bank profitability in terms of return on assets and return on equity. Likewise, Pradhan (2014) showed that gross domestic product and market share are positively related to bank profitability, whereas inflation and liquidity are negatively related to bank profitability. Khanal et al. (2022) examined the effect of capital adequacy ratio on the financial

stability of Nepalese commercial banks. The study showed that capital adequacy ratio has a negative impact on Z-score of return on assets and Z-score of return on equity. It indicates that the increase in capital adequacy ratio leads to decrease in Z-score of return on assets and Z-score of return on equity. Likewise, return on assets has a positive impact on Z-score of return on assets and Z-score of return on equity. It indicates that the increase in return on assets leads to increase in Z-score of return on assets and Z-score of return on equity.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of macro-economic factors on stability of 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 main purpose of the study is to analyse the impact of macro-economic factors on the stability of Nepalese financial institutions. Specifically, it examines the relationship of inflation rate, money supply, unemployment rate, GDP growth rate, exchange rate and interest rate with return on equity and Z-score of Nepalese financial institutions.

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 secondary data which were gathered from 10 Nepalese commercial banks and 7 development banks from 2015/16 to 2020/21, leading to a total of 102 observations. The main sources of data include publications and websites of Nepal Rastra Bank (NRB), and annual reports of the selected commercial banks and development banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks and development banks selected for the study along with the study period and number of observations.

**Table 1:** List of commercial banks and development banks selected for the study along with study period and number of observations

| S. N. | Name of the commercial banks          | Study period      | Observations |
|-------|---------------------------------------|-------------------|--------------|
| 1     | Global IME Bank Limited               | 2015/16 - 2020/21 | 6            |
| 2     | Agricultural Development Bank Limited | 2015/16 - 2020/21 | 6            |
| 3     | NMB Bank Limited                      | 2015/16 - 2020/21 | 6            |
| 4     | Nepal Investment Bank Limited         | 2015/16 - 2020/21 | 6            |
| 5     | Prime Commercial Bank Limited         | 2015/16 - 2020/21 | 6            |
| 6     | Mega Bank Nepal Limited               | 2015/16 - 2020/21 | 6            |
| 7     | Kumari Bank Ltd                       | 2015/16 - 2020/21 | 6            |
| 8     | Nabil Bank Ltd                        | 2015/16 - 2020/21 | 6            |
| 9     | Citizens Bank International Ltd.      | 2015/16 - 2020/21 | 6            |
| 10    | NIC Asia Bank Ltd                     | 2015/16 - 2020/21 | 6            |

| S. N.                               | Name of the development banks     | Study period      | Observations |
|-------------------------------------|-----------------------------------|-------------------|--------------|
| 1                                   | Muktinath Bikas Bank Limited      | 2015/16 - 2020/21 | 6            |
| 2                                   | Jyoti Bikas Bank Limited          | 2015/16 - 2020/21 | 6            |
| 3                                   | Garima Bikas Bank Limited         | 2015/16 - 2020/21 | 6            |
| 4                                   | Mahalaxmi Bikas Bank Limited      | 2015/16 - 2020/21 | 6            |
| 5                                   | Kamana Sewa Bikas Bank Limited    | 2015/16 - 2020/21 | 6            |
| 6                                   | Lumbini Bikash Bank Limited       | 2015/16 - 2020/21 | 6            |
| 7                                   | Sangrila Development Bank Limited | 2015/16 - 2020/21 |              |
| <b>Total number of observations</b> |                                   |                   | <b>102</b>   |

Thus, the study is based on the 102 observations.

## The models

The model used in this study assumes that financial stability depends on macro-economic factors. The dependent variables selected for the study are return on equity and Z-score. Similarly, the selected independent variables in this study are inflation rate, money supply, unemployment rate, GDP growth rate, exchange rate and interest rate. The following model equations are designed to test the hypothesis.

$$ROE_{it} = \beta_0 + \beta_1 INF_t + \beta_2 MS_{it} + \beta_3 UNEMP_{it} + \beta_4 GDP_{it} + \beta_5 ER_{it} + \beta_6 IR_{it} + e_{it}$$

$$Z-Score_{it} = \beta_0 + \beta_1 INF_t + \beta_2 MS_{it} + \beta_3 UNEMP_{it} + \beta_4 GDP_{it} + \beta_5 ER_{it} + \beta_6 IR_{it} + e_{it}$$

Where,

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

Z-Score = Z-score of return on assets defined as return on assets (ROA) plus the equity to assets for bank *i* for the given period divided by the standard deviation (SD) of ROA (%) over the sample period.

MS = Money supply as measured by the broad money, USD in billion.

UNEMP = Unemployment rate defined as unemployed number of people to total labor force, in percentage.

GDP = Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion.

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

ER = Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD.

IR = Interest rate as measured by the lending cost of the bank, in percentage.

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

## Inflation

Inflation is 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. Yong and Floros (2012) concluded that there is a positive relationship between inflation and profitability of banking sectors. Similarly, Vong and Chan (2009) found that there is a positive relationship between inflation and bank performance. Moreover, Perry (1992) found that inflation has a significant positive effect on banking profitability. Furthermore, Sufian and Kamarudin (2012) revealed that there is a significant and positive relationship of inflation with bank profitability. Moreover, Kiganda (2014) concluded that inflation has a positive and insignificant impact on commercial banks profitability. Similarly, Srairi (2013) concluded that inflation rate has a positive impact on banking stability. In addition, Guru et al. (2002) found that there is a positive relationship of inflation rate with bank profitability. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between inflation and financial stability.

## Exchange rate

According to Simiyu and Ngile (2015), exchange rate (also known as a foreign-exchange rate, forex rate, between two currencies) is the rate at which one currency will be exchanged for another. Likewise, Aburime (2008) found that exchange rate has significant and positive influence over profitability. Similarly, Athanasoglou et al. (2008) found that exchange rates positively influence the profitability of banking sector. In addition, Mohammadi et al. (2016) found that exchange rate volatility has the positive impact on the banks stability. Moreover, Taiwo and Adesola (2013) found that there is positive relationship between exchange rate and bank stability. Furthermore, Acaravci and Calim (2013) showed that real exchange rate has significant effect on bank profitability. Similarly, Babazadeh and Farrokhnejad (2012) revealed that exchange rate is significant determinant of profits. Based on it, the study develops the following hypothesis.

H<sub>2</sub>: There is positive relationship between exchange rate and financial stability.

## GDP growth rate

GDP rate is defined as measure of the total economic activity and it is adjusted for inflation. Ratnawati (2020) examined the impact of financial inclusion on economic growth, poverty, income inequality, and financial stability in Asia. The study found a positive relationship between economic growth and financial stability. Similarly, Erina and Lace (2013) revealed that GDP has a positive impact on profitability as measured by ROA and ROE. Moreover, Goddard et al. (2004) estimated the profitability of 583 European Union domestic banks. The study showed that there is a significant positive effect of GDP on profits. Furthermore, Saksonova and Solovjova (2011) performed comparative analysis of five largest Latvian commercial banks during period of economic crisis. The study found that GDP growth had positive contribution to bank profits. Likewise, Creel et al. (2015) also explored the profitability of sampled US commercial banks. The study found a positive impact of per-capita income on profitability. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is positive relationship between GDP growth rate and financial stability.

## Money supply

Kosmidou (2008) stated that money supply refers to the quantity of money available and it depends on the monetary policy that is being followed. Taguchi (1995) found a positive and significant impact of broad money supply on the bank performance. Chaker et al. (2012) found that money supply is positively correlated to bank profitability. Similarly, Amidu (2006) revealed that there is a positive and significant impact of broad money supply on the bank performance. Al-Qudah and Jaradat (2013) concluded that growth in money supply has a positive effect on the profitability. Furthermore, Pan and Pan (2014) found that money supply growth have positive correlations with bank profitability. Moreover, Jumono and Mala (2019) stated that money supply has a positive and significant impact on the ROE. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is positive relationship between money supply and financial stability.

## Interest rate

Khan and Sattar (2014) described interest rate as the certain amount of cash compensated by someone on the utilization of funds for a specific time period. Borio et al. (2017) concluded that interest rate has

a positive relationship with profitability. Moreover, Prasetyantoko and Parmono (2012) concluded that interest rate is positively related to firm performance. Okoye and Eze (2013) showed that there is a positive and significant relationship between bank rate and bank performance in both short term and long term. Similarly, Otouri (2013); Punita and Somaiya (2006) concluded that bank rate has positive and significant impacts on performance. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is positive relationship between interest rate and financial stability.

## Unemployment rate

Unemployment means the proportion of unemployed labor. The higher proportion of unemployment affects the cash flow streams of households (Jadah et al., 2020). Akani et al. (2016) revealed that unemployment rate has a negative and insignificant effect on return on investment, return on assets and return on equity. Similarly, Elia et al. (2021) found a weak negative relationship between unemployment and bank stability. Similarly, Ali et al. (2012) concluded that unemployment doesn't have a significant impact on the profitability of the Islamic banks. Moreover, Bekeris (2012) concluded that unemployment has a negative impact on the firm profitability. Furthermore, Ghurtskaia (2018) revealed that unemployment has a weak relationship with banks profitability. Widodo et al. (2022) argued that unemployment has negative effect on the profitability. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is negative relationship between unemployment rate and financial 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 2020/21.

**Table 2 : Descriptive statistics**

This table shows the descriptive statistics of dependent and independent variables for the study period from 2015/16 to 2020/21. The dependent variables are ROE (Return on equity as measured by the ratio of net income by total equity, in percentage) and Z-score (Z-score of return on assets defined as return on assets (ROA) plus the equity to assets for bank *i* for the given period divided by the standard deviation (SD) of ROA (%) over the sample period). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| Panel A: Descriptive statistics for commercial banks |         |         |        |                |
|------------------------------------------------------|---------|---------|--------|----------------|
| Variables                                            | Minimum | Maximum | Mean   | Std. Deviation |
| ROE                                                  | 8.92    | 49.51   | 18.26  | 9.28           |
| Z-score                                              | 0.13    | 1.74    | 0.47   | 0.29           |
| INF                                                  | 3.63    | 8.79    | 5.19   | 1.74           |
| MS                                                   | 15.50   | 21.80   | 18.35  | 2.21           |
| UNEMP                                                | 2.85    | 4.44    | 3.30   | 0.57           |
| GDP                                                  | -2.10   | 9.00    | 4.26   | 4.01           |
| ER                                                   | 104.40  | 118.20  | 110.73 | 5.38           |
| IR                                                   | 5.00    | 7.00    | 6.25   | 0.90           |



| Panel B: Descriptive statistics for development banks |        |        |        |      |
|-------------------------------------------------------|--------|--------|--------|------|
| ROE                                                   | 4.71   | 28.09  | 16.43  | 5.24 |
| Z-score                                               | 0.04   | 2.38   | 0.44   | 0.51 |
| INF                                                   | 3.63   | 8.79   | 5.11   | 1.68 |
| MS                                                    | 15.50  | 21.80  | 18.32  | 2.24 |
| UNEMP                                                 | 2.85   | 4.44   | 3.30   | 0.57 |
| GDP                                                   | -2.10  | 9.00   | 4.36   | 4.03 |
| ER                                                    | 104.40 | 118.20 | 110.83 | 5.42 |
| IR                                                    | 5.00   | 7.00   | 6.23   | 0.91 |

Source: SPSS output

## Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed and the results are presented in Table 3 and Table 4. More specifically, Table 3 shows the Pearson's correlation coefficients of selected variables for the selected Nepalese commercial banks.

**Table 3:** Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 10 Nepalese commercial banks for the study period from 2015/16 to 2020/21. The dependent variables are ROE (Return on equity as measured by the ratio of net income by total equity, in percentage) and Z-score (Z-score of return on assets defined as return on assets (ROA) plus the equity to assets for bank *i* for the given period divided by the standard deviation (SD) of ROA (%) over the sample period). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| Variables | ROE    | Z-score | INF      | MS       | UNEMP    | GDP      | ER       | IR |
|-----------|--------|---------|----------|----------|----------|----------|----------|----|
| ROE       | 1      |         |          |          |          |          |          |    |
| Z-score   | -0.113 | 1       |          |          |          |          |          |    |
| INF       | 0.175  | -0.030  | 1        |          |          |          |          |    |
| MS        | -0.139 | 0.092   | 0.117    | 1        |          |          |          |    |
| UNEMP     | -0.225 | -0.170  | -0.101   | 0.285*   | 1        |          |          |    |
| GDP       | 0.082  | 0.154   | -0.555** | -0.380** | -0.767** | 1        |          |    |
| ER        | -0.214 | -0.047  | -0.172   | 0.286*   | 0.702**  | -0.455** | 1        |    |
| IR        | 0.260* | 0.074   | 0.248    | -0.431** | -0.865** | 0.560**  | -0.941** | 1  |

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

Table 3 reveals that the inflation rate has a positive relationship with return on equity. It indicates that increase in inflation rate leads to increase in return on equity. Similarly, money supply has a negative relationship with return on equity. It means higher the money supply, lower would be the return on equity. The result also shows that unemployment rate has a negative relationship with the return on equity. It indicates that increase in unemployment rate leads to decrease in return in equity. Similarly, gross domestic product has a positive relationship with return on equity. It indicates that increase in gross domestic product leads to increase in return on equity. The result also indicates that exchange rate has the negative



relationship with return on equity. It means higher the exchange rate, lower would be the return on equity. Similarly, interest rate has a positive relationship with return on equity. It indicates that increase in interest rate leads to increase the return on equity. Likewise, inflation rate has a negative relationship with Z-score. It indicates that increase in inflation rate leads to decrease in Z-score. Similarly, money supply has the positive relationship with Z-score. It means higher the money supply; higher would be the Z-score. The result also shows that unemployment rate has a negative relationship with Z-score. It indicates that increase in unemployment rate leads to decrease in Z-score. Similarly, gross domestic product has a positive relationship with Z-score. It indicates that increase in gross domestic product leads to increase in Z-score. The result also indicates that exchange rate has the negative relationship with Z-score. It means higher the exchange rate, lower would be the Z-score. Similarly, interest rate has a positive relationship with Z-score. It indicates that increase in interest rate leads to increase in Z-score in the context of Nepalese commercial banks.

Table 4 shows the Pearson's correlation coefficients of selected variables for selected Nepalese development banks.

**Table 4:** Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 7 Nepalese development banks for the study period from 2015/16 to 2020/21. The dependent variables are ROE (Return on equity as measured by the ratio of net income by total equity, in percentage) and Z-score (Z-score of return on assets defined as return on assets (ROA) plus the equity to assets for bank *i* for the given period divided by the standard deviation (SD) of ROA (%) over the sample period). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| Variables | ROE     | Z-score | INF      | MS       | UNEMP    | GDP      | ER       | IR |
|-----------|---------|---------|----------|----------|----------|----------|----------|----|
| ROE       | 1       |         |          |          |          |          |          |    |
| Z-score   | 0.037   | 1       |          |          |          |          |          |    |
| INF       | 0.269   | 0.017   | 1        |          |          |          |          |    |
| MS        | 0.073   | -0.191  | 0.096    | 1        |          |          |          |    |
| UNEMP     | -0.311* | -0.215  | -0.083   | 0.293    | 1        |          |          |    |
| GDP       | 0.106   | 0.167   | -0.540** | -0.374*  | -0.788** | 1        |          |    |
| ER        | -0.003  | -0.258  | -0.139   | 0.300    | 0.700**  | -0.484** | 1        |    |
| IR        | 0.140   | 0.272   | 0.220    | -0.447** | -0.865** | 0.591**  | -0.940** | 1  |

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

Table 4 reveals that the inflation rate has a positive relationship with return on equity. It indicates that increase in inflation rate leads to increase in return on equity. Similarly, money supply has a positive relationship with return on equity. It means higher the money supply, higher would be the return on equity. The result also shows that unemployment rate has the negative relationship with the return on equity. It indicates that increase in unemployment rate leads to decrease in return in equity. Similarly, gross domestic product has a positive relationship with return on equity. It indicates that increase in gross domestic product leads to increase in return on equity. The result also indicates that exchange rate has a negative relationship with return on equity. It means higher the exchange rate, lower would be the return on equity. Similarly, interest rate has a positive relationship with return on equity. It indicates that increase in interest rate leads

to increase the return on equity. Likewise, inflation rate has a positive relationship with Z-score. It indicates that increase in inflation rate leads to increase in Z-score. Similarly, money supply has a negative relationship with Z-score. It means higher the money supply, lower would be the Z-score. The result also shows that unemployment rate has a negative relationship with Z-score. It indicates that increase in unemployment rate leads to decrease in Z-score. Similarly, gross domestic product has a positive relationship with Z-score. It indicates that increase in gross domestic product leads to increase in Z-score. The result also indicates that exchange rate has a negative relationship with Z-score. It means higher the exchange rate, lower would be the Z-score. Similarly, interest rate has a positive relationship with Z-score. It indicates that increase in interest rate leads to increase in Z-score in the context of Nepalese development banks.

## **Regression analysis**

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 5. More specifically, it shows the regression results of inflation rate, money supply, unemployment rate, GDP growth rate, exchange rate and interest rate on return on equity of Nepalese commercial banks.

**Table 5:** Estimated regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on return on equity of Nepalese commercial banks

The results are based on panel data of 10 Nepalese commercial banks for the period from 2015/16 to 2020/21 by using linear regression model. The model is  $ROE_{it} = \beta_0 + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 UNEMP_{it} + \beta_4 GDP_{it} + \beta_5 ER_{it} + \beta_6 IR_{it} + \epsilon_{it}$  where the dependent variable is ROE (Return on equity as measured by the ratio of net income by total equity, in percentage). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| S.N. | Intercept           | Regression coefficients of |                   |                   |                  |                   |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|------|---------------------|----------------------------|-------------------|-------------------|------------------|-------------------|-------------------|-------------------------|-------|---------|
|      |                     | INF                        | MS                | UNEMP             | GDP              | ER                | IR                |                         |       |         |
| 1    | 13.445<br>(3.573)** | 0.927<br>(1.350)           |                   |                   |                  |                   |                   | 0.014                   | 9.225 | 1.823   |
| 2    | 28.968<br>(2.878)** |                            | -0.583<br>(1.071) |                   |                  |                   |                   | 0.002                   | 9.278 | 1.146   |
| 3    | 30.349<br>(4.352)** |                            |                   | -3.660<br>(1.758) |                  |                   |                   | 0.034                   | 9.129 | 3.091   |
| 4    | 17.451<br>(9.874)** |                            |                   |                   | 0.191<br>(0.630) |                   |                   | 0.010                   | 9.337 | 0.397   |
| 5    | 59.150<br>(2.410)** |                            |                   |                   |                  | -0.369<br>(1.668) |                   | 0.029                   | 9.152 | 2.781   |
| 6    | 1.684<br>(0.206)    |                            |                   |                   |                  |                   | 2.653<br>(2.047)* | 0.051                   | 9.048 | 4.192   |
| 7    | 25.361<br>(2.474)*  | 1.028<br>(1.493)           | -0.678<br>(1.249) |                   |                  |                   |                   | 0.023                   | 9.181 | 1.700   |
| 8    | 41.488<br>(3.370)** |                            |                   | -6.381<br>(1.927) | 0.505<br>(1.097) |                   |                   | 0.038                   | 9.113 | 2.153   |
| 9    | -64.497<br>(0.681)  |                            |                   |                   |                  | -0.455<br>(0.702) | 5.186<br>(1.352)  | 0.043                   | 9.088 | 2.324   |
| 10   | 31.434<br>(2.810)** | 0.900<br>(1.303)           | -0.455<br>(0.804) | -2.878<br>(1.313) |                  |                   |                   | 0.035                   | 9.123 | 1.722   |
| 11   | -87.749<br>(0.883)  |                            |                   |                   | 0.295<br>(0.799) | -0.592<br>(0.880) | 6.679<br>(1.561)  | 0.037                   | 9.117 | 1.752   |
| 12   | 29.225<br>(0.740)   | 1.403<br>(1.396)           | -0.368<br>(0.624) |                   | 0.380<br>(0.762) | -0.118<br>(0.387) |                   | 0.020                   | 9.195 | 1.303   |
| 13   | -97.580<br>(0.554)  |                            |                   | -0.381<br>(0.049) | 0.277<br>(0.532) | -0.623<br>(0.676) | 7.012<br>(0.874)  | 0.019                   | 9.199 | 1.291   |

**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 unemployment rate are negative with return on equity. It indicates that unemployment rate has a negative impact on return on equity. This finding is similar to the findings of Akani et al. (2016). Moreover, the beta coefficients for gross domestic product are positive with return on equity. It indicates that gross domestic product has a positive impact on return on equity. This finding is

similar to the findings of Erina and Lace (2013). However, the beta coefficients for exchange rate are negative with return on equity. It indicates that exchange rate has a negative impact on return on equity. This finding is similar to the findings of Taiwo and Adesola (2013). The result also shows that the beta coefficients for interest rate are positive with return on equity. It indicates that interest rate has a positive impact on return on equity. This finding is similar to the findings of Borio et al. (2017). Furthermore, 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 Vong and Chan (2009). However, the beta coefficients for money supply are negative with return on equity. It indicates that money supply has a negative impact on return on equity. This finding is similar to the findings of Chaker et al. (2012).

Table 6 shows the regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on return on equity of Nepalese development banks.

**Table 6:** Estimated regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on return on equity of Nepalese development banks

The results are based on panel data of 7 Nepalese development banks for the period from 2015/16 to 2020/21 by using linear regression model. The model is  $ROE_{it} = \beta_0 + \beta_1 INF_{it} + \beta_2 MS_{it} + \beta_3 UNEMP_{it} + \beta_4 GDP_{it} + \beta_5 ER_{it} + \beta_6 IR_{it} + \epsilon_{it}$  where the dependent variable is ROE (Return on equity as measured by the ratio of net income by total equity, in percentage). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| S.N. | Intercept            | Regression coefficients of |                  |                     |                  |                   |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|------|----------------------|----------------------------|------------------|---------------------|------------------|-------------------|------------------|-------------------------|-------|---------|
|      |                      | INF                        | MS               | UNEMP               | GDP              | ER                | IR               |                         |       |         |
| 1    | 12.148<br>(4.697)**  | 0.839<br>(1.743)           |                  |                     |                  |                   |                  | 0.049                   | 5.118 | 3.040   |
| 2    | 13.307<br>(1.932)    |                            | 0.171<br>(0.458) |                     |                  |                   |                  | 0.020                   | 5.299 | 0.210   |
| 3    | 25.768<br>(5.564)**  |                            |                  | -2.821<br>(2.045)   |                  |                   |                  | 0.074                   | 5.051 | 4.181   |
| 4    | 15.836<br>(12.936)** |                            |                  |                     | 0.138<br>(0.665) |                   |                  | 0.014                   | 5.284 | 0.442   |
| 5    | 16.724<br>(0.973)    |                            |                  |                     |                  | -0.003<br>(0.017) |                  | 0.026                   | 5.314 | 0.000   |
| 6    | 11.429<br>(1.998)    |                            |                  |                     |                  |                   | 0.804<br>(0.885) | 0.005                   | 5.262 | 0.783   |
| 7    | 10.175<br>(1.458)    | 0.825<br>(1.686)           | 0.112<br>(0.305) |                     |                  |                   |                  | 0.026                   | 5.179 | 1.531   |
| 8    | 36.550<br>(4.319)**  |                            |                  | -5.449<br>(2.471)*  | 0.479<br>(1.512) |                   |                  | 0.103                   | 4.969 | 3.303   |
| 9    | -143.979<br>(2.347)  |                            |                  |                     |                  | -1.068<br>(2.543) | 6.747<br>(2.712) | 0.118                   | 4.928 | 3.679   |
| 10   | 16.493<br>(2.260)    | 0.707<br>(1.502)           | 0.350<br>(0.952) | -3.048<br>(2.140)*  |                  |                   |                  | 0.110                   | 4.951 | 2.643   |
| 11   | -153.540<br>(2.361)  |                            |                  |                     | 0.122<br>(0.485) | -1.124<br>(2.556) | 7.375<br>(2.610) | 0.100                   | 4.978 | 2.482   |
| 12   | -201.114<br>(2.033)  | 10.188<br>(2.357)          | 1.266<br>(2.331) | -34.333<br>(2.019)* | 6.585<br>(2.205) |                   |                  | 0.194                   | 4.711 | 3.405   |
| 13   | -86.126<br>(0.593)   | 6.763<br>(1.262)           | 0.658<br>(0.841) | -16.566<br>(0.700)  | 4.029<br>(1.058) |                   | 2.635<br>(1.078) | 0.197                   | 4.701 | 2.968   |

#### 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 is the dependent variable.

Table 6 shows that the beta coefficients for money supply are positive with return on equity. It indicates that money supply has a positive impact on return on equity. This finding is similar to the findings of Al-Qudah and Jaradat (2013). Similarly, the beta coefficients for unemployment rate are negative with return on equity. It indicates that unemployment rate has a negative impact on return on equity. This finding is similar to the findings of Elia et al. (2021). Moreover, the beta coefficients for gross domestic product are positive with return on equity. It indicates that gross domestic product has a positive impact on return on equity. This finding is similar to the findings of Saksonova and Solovjova (2011). However, the beta coefficients for exchange rate are negative with return on equity. It indicates that exchange rate has a negative impact on return on equity. This finding is similar to the findings of Acaravci and Calim (2013). The result also shows that the beta coefficients for interest rate are positive with return on equity. It indicates that interest rate has a positive impact on return on equity. This finding is similar to the findings of Punita and Somaiya (2006).

Table 7 shows the regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on Z-score of Nepalese commercial banks.

**Table 7:** Estimated Regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on Z-score of Nepalese commercial banks

The results are based on panel data of 10 Nepalese commercial banks for the period from 2015/16 to 2020/21 by using linear regression model. The model is  $Z\text{-score} = \beta_0 + \beta_1 INF + \beta_2 MS + \beta_3 UNEMP + \beta_4 GDP + \beta_5 ER + \beta_6 IR + \epsilon$  where the dependent variable is Z-score (Z-score of return on assets defined as return on assets (ROA) plus the equity to assets for bank  $i$  for the given period divided by the standard deviation (SD) of ROA (%) over the sample period). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| S.N. | Intercept          | Regression coefficients of |                  |                   |                  |                   |                  | Adj. R <sup>2</sup> | SEE   | F-value |
|------|--------------------|----------------------------|------------------|-------------------|------------------|-------------------|------------------|---------------------|-------|---------|
|      |                    | INF                        | MS               | UNEMP             | GDP              | ER                | IR               |                     |       |         |
| 1    | 0.500<br>(4.147)** | -0.005<br>(0.231)          |                  |                   |                  |                   |                  | 0.016               | 0.295 | 0.053   |
| 2    | 0.251<br>(0.787)   |                            | 0.012<br>(0.700) |                   |                  |                   |                  | 0.009               | 0.294 | 0.490   |
| 3    | 0.762<br>(3.424)** |                            |                  | -0.087<br>(1.314) |                  |                   |                  | 0.012               | 0.291 | 1.728   |
| 4    | 0.426<br>(7.697)** |                            |                  |                   | 0.011<br>(1.187) |                   |                  | 0.007               | 0.292 | 1.409   |
| 5    | 0.757<br>(0.956)   |                            |                  |                   |                  | -0.003<br>(0.359) |                  | 0.015               | 0.295 | 0.129   |
| 6    | 0.324<br>(1.215)   |                            |                  |                   |                  |                   | 0.024<br>(0.573) | 0.012               | 0.295 | 0.322   |
| 7    | 0.276<br>(0.833)   | -0.007<br>(0.313)          | 0.013<br>(0.726) |                   |                  |                   |                  | 0.025               | 0.297 | 0.290   |

|    |                   |                   |                  |                   |                  |                   |                  |       |       |       |
|----|-------------------|-------------------|------------------|-------------------|------------------|-------------------|------------------|-------|-------|-------|
| 8  | 0.669<br>(1.688)  |                   |                  | -0.065<br>(0.621) | 0.004<br>(0.282) |                   |                  | 0.004 | 0.294 | 0.890 |
| 9  | -1.246<br>(0.403) |                   |                  |                   |                  | -0.011<br>(0.510) | 0.084<br>(0.671) | 0.025 | 0.297 | 0.289 |
| 10 | 0.519<br>(1.447)  | -0.012<br>(0.545) | 0.022<br>(1.195) | -0.115<br>(0.107) |                  |                   |                  | 0.005 | 0.292 | 1.093 |
| 11 | -0.365<br>(0.113) |                   |                  |                   | 0.011<br>(0.929) | -0.006<br>(0.255) | 0.027<br>(0.197) | 0.027 | 0.297 | 0.480 |
| 12 | -2.472<br>(0.479) | -0.118<br>(0.524) | 0.034<br>(1.209) | -0.399<br>(0.449) | 0.091<br>(0.580) |                   |                  | 0.007 | 0.294 | 0.894 |
| 13 | -1.046<br>(0.137) | -0.076<br>(0.270) | 0.027<br>(0.652) | -0.178<br>(0.143) | 0.059<br>(0.294) | -0.033<br>(0.256) |                  | 0.025 | 0.297 | 0.716 |

**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. Z-score is the dependent variable.

Table 7 shows that the beta coefficients for inflation rate are negative with Z-score. It indicates that inflation rate has a negative impact on Z-score. This finding is similar to the findings of Srairi (2013). However, the beta coefficients for money supply are positive with Z-score. It indicates that money supply has a positive impact on Z-Score. This finding is similar to the findings of Taguchi (1995). Similarly, the beta coefficients for unemployment rate are negative with Z-Score. It indicates that unemployment rate has a negative impact on Z-Score. This finding is similar to the findings of Ali et al. (2012). Moreover, the beta coefficients for gross domestic product are positive with Z-Score. It indicates that gross domestic product has a positive impact on Z-Score. This finding is similar to the findings of Ratnawati (2020). However, the beta coefficients for exchange rate are negative with Z-Score. It indicates that exchange rate has a negative impact on Z-Score. This finding is similar to the findings of Athanasoglou et al. (2008).

Table 8 shows the regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on Z-Score of Nepalese commercial banks.

**Table 8:** Estimated regression results of inflation rate, money supply, unemployment rate, GDP, exchange rate and interest rate on Z-score of Nepalese development banks

The results are based on panel data of 7 Nepalese development banks for the period from 2015/16 to 2020/21 by using linear regression model. The model is  $Z\text{-score} = \beta_0 + \beta_1 INF_t + \beta_2 MS_t + \beta_3 UNEMP_t + \beta_4 GDP_t + \beta_5 ER_t + \beta_6 IR_t + \epsilon_{it}$  where the dependent variable is Z-score (Z-score of return on assets defined as return on assets (ROA) plus the equity to assets for bank  $i$  for the given period divided by the standard deviation (SD) of ROA (%) over the sample period). The independent variables are INF (Inflation rate as measured by the change in consumer price index, in percentage), MS (Money supply as measured by the broad money, USD in billion), UNEMP (Unemployment rate defined as unemployed number of people to total labor force, in percentage), GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), ER (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD).

| S.N. | Intercept         | Regression coefficients of |                   |       |     |    |    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|------|-------------------|----------------------------|-------------------|-------|-----|----|----|-------------------------|-------|---------|
|      |                   | INF                        | MS                | UNEMP | GDP | ER | IR |                         |       |         |
| 1    | 0.416<br>(1.583)  | 0.005<br>(0.104)           |                   |       |     |    |    | 0.025                   | 0.519 | 0.011   |
| 2    | 1.243<br>(1.875)* |                            | -0.044<br>(1.218) |       |     |    |    | 0.012                   | 0.510 | 1.483   |

|    |                    |                  |                   |                   |                   |                   |                  |       |       |       |
|----|--------------------|------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------|-------|-------|
| 3  | 1.072<br>(2.301)*  |                  |                   | -0.190<br>(1.372) |                   |                   |                  | 0.022 | 0.508 | 1.884 |
| 4  | 0.349<br>(2.938)** |                  |                   |                   | 0.021<br>(1.058)  |                   |                  | 0.003 | 0.513 | 1.119 |
| 5  | 3.144<br>(1.934)*  |                  |                   |                   |                   | -0.024<br>(1.665) |                  | 0.042 | 0.502 | 2.771 |
| 6  | -0.509<br>(0.936)  |                  |                   |                   |                   |                   | 0.153<br>(1.766) | 0.050 | 0.500 | 3.119 |
| 7  | 1.203<br>(1.726)   | 0.011<br>(0.220) | -0.045<br>(1.218) |                   |                   |                   |                  | 0.013 | 0.517 | 0.747 |
| 8  | 1.088<br>(1.242)   |                  |                   | -0.194<br>(0.581) | -0.001<br>(0.022) |                   |                  | 0.004 | 0.515 | 0.918 |
| 9  | -0.294<br>(0.047)  |                  |                   |                   |                   | -0.001<br>(0.034) | 0.144<br>(0.564) | 0.025 | 0.507 | 1.520 |
| 10 | 1.518<br>(1.994)*  | 0.005<br>(0.099) | -0.033<br>(0.851) | -0.152<br>(1.025) |                   |                   |                  | 0.011 | 0.516 | 0.849 |
| 11 | -0.175<br>(0.026)  |                  |                   |                   | 0.002<br>(0.058)  | -0.002<br>(0.048) | 0.137<br>(0.468) | 0.001 | 0.514 | 0.988 |
| 12 | 15.647<br>(1.457)  | 0.611<br>(1.302) | -0.092<br>(1.563) | -2.579<br>(1.397) | 0.428<br>(1.319)  |                   |                  | 0.008 | 0.511 | 1.084 |
| 13 | 15.296<br>(0.954)  | 0.600<br>(1.016) | -0.090<br>(1.046) | -2.525<br>(0.968) | 0.420<br>(0.999)  |                   | 0.008<br>(0.030) | 0.020 | 0.519 | 0.844 |

**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. Z-score is the dependent variable.

Table 8 shows that the beta coefficients for money supply are negative with Z-score. It indicates that money supply has a negative impact on Z-score. This finding is similar to the findings of Amidu (2006). Similarly, the beta coefficients for unemployment rate are negative with Z-Score. It indicates that unemployment rate has a negative impact on Z-Score. This finding is similar to the findings of Bekeris (2012). Moreover, the beta coefficients for gross domestic product are positive with Z-score. It indicates that gross domestic product has a positive impact on Z-Score. This finding is similar to the findings of Creel et al. (2015). However, the beta coefficients for exchange rate are negative with Z-score. It indicates that exchange rate has a negative impact on Z-score. This finding is similar to the findings of Babazadeh and Farrokhnejad (2012). The result also shows that the beta coefficients for interest rate are positive with Z-score. It indicates that interest rate has a positive impact on Z-score. This finding is similar to the findings of Prasetyantoko and Parmono (2012).

## 4. Summary and conclusion

Financial instability refers to conditions in financial markets that harm, or threaten to harm the economy through their impact on the working of the financial system. Such instability harms the working of the economy in various ways. It can impair the financial condition of non-financial units such as households,

enterprises, and governments to the degree that the flow of finance to them becomes restricted. A stable macroeconomic environment is a fundamental condition for healthy financial sector performance.

This study attempts to analyze the effects of macroeconomic indicators on the stability of the Nepalese financial system. The study is based on secondary data of 10 Nepalese commercial banks and 7 Nepalese development banks with 102 observations for the period from 2015/16 to 2020/21.

The study showed that money supply, unemployment rate and exchange rate have negative impact on the return on equity and Z-score of Nepalese commercial banks. However, inflation rate, GDP and interest rate have positive impact on the return on equity and Z-score. In addition, the study also showed that unemployment rate and exchange rate have negative impact on the return on equity and Z-score of Nepalese development banks. However, inflation rate, GDP and interest rate have positive impact on the return on equity and Z-score. The study concluded that interest rate is the most significant factors that explains the stability of Nepalese commercial banks. The study also concluded that the macroeconomic factors have the negligible role in explaining the stability of Nepalese development banks.

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## Abstract

*This study examines the impact of macro-economic factors on the non-performing loans of Nepalese commercial banks. Non-performing loans and loan loss provision are selected as the dependent variables. Similarly, gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate are selected as the independent variables. This study is based on secondary data of 20 commercial banks with 160 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic factors on the non-performing loans of Nepalese commercial banks.*

*The study showed that gross domestic product has a negative impact on non-performing loan and loan loss provision. It indicates that increase in gross domestic product leads to decrease in non-performing loan and loan loss provision. Moreover, unemployment rate has a positive impact on non-performing loan and loan loss provision. It indicates that increase the unemployment rate leads to increase in non-performing loan and loan loss provision of Nepalese commercial banks. In addition, remittance has a negative impact on non-performing loan and loan loss provision. It indicates that increase the remittance leads to decrease in non-performing loan and loan loss provision. Similarly, exchange rate has a negative impact on non-performing loan and loan loss provision. It indicates that increase in exchange rate leads to decrease in non-performing loan and loan loss provision. Moreover, money supply has a positive impact on non-performing loan and loan loss provision. It indicates that increase in money supply leads to increase in non-performing loan and loan loss provision. Furthermore, there is a positive impact of inflation on non-performing loan and loan loss provision. It indicates that increase in inflation leads to increase in non-performing loan and loan loss provision.*

**Keywords:** Non-performing loans, loan loss provision, gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate.

# 1. Introduction

Banks play an important role in the economic growth of any country. It strengthens economic activities and growth by making efficient use and mobilization of funds. Banking systems with sound profitable grounds makes economy more stable and enduring (Asif et al., 2017). Macroeconomic theory states that expansionary situation creates optimistic environment and recession or declining phase may generate pessimistic environment in the business (Mankiw, 2011). Hence, business people will demand more credit for their investment activities during the expansionary phase of the economy while they may be reluctant to invest and reduce the demand of credit during contractionary phase of the economy (Dash and Kabra, 2010).

GDP growth reflects a positive economic environment which is beneficial for both businesses and households. Salas and Saurina (2002) found that a significant negative contemporaneous effect of GDP growth on the non-performing loans ratio and infer a quick transmission of macroeconomic developments to the ability of economic agents to service their loans. Likewise, Saba et al. (2019) found that real GDP per capita has a significant impact on non-performing loan ratio. Moreover, Foglia (2022) found that gross domestic product has a negative impact on non-performing loans. Furthermore, Laeven and Majnoni (2003) showed that GDP growth (gross domestic product) has a negative relationship with loan loss provision. Sinkey and Greenwalt (1991) concluded that excessive financing and interest rate is regarded main reason for high rate of non-performing loan. Likewise, Rajan and Dhal (2003) asserted that macroeconomic factor and financial factors have a significant impact on the non-performing loans rate. Loan loss provision is a type of capital that should be built up during good times to absorb losses during bad times (Wall and Koch, 2000). Similarly, loan loss provision can be viewed as a cushioning mechanism which may ensure that banks do not unexpectedly lose their entire outstanding loan balances (Craigwell and Elliott, 2011).

Ahmed et al. (2021) examined the impact of bank specific and macro-economic factors on non-performing loans in the banking sector of emerging countries. The study found that higher interest rates, exchange rates and political risk significantly increase non-performing loans, while GDP growth decreases non-performing loans. Similarly, Sinaga et al. (2020) found that exchange rate has an insignificant effect on lending of commercial banks. Likewise, Osunnaiye and Alymkulova (2022) assessed the impact of non-performing loans on Nigerian economic growth during 2011-2020. The study concluded that bivariate co-integration between non-performing loan, money supply and interest rates. Likewise, Anita et al. (2022) found that there is a significant positive association with the government budget balance and a significant inverse relationship with money supply. Similarly, Murumba (2013) analyzed the relationship between real GDP and non-performing loans in Nigeria. The study showed positive and significant relationship between real GDP and non-performing loan. Likewise, Reddy (2015) concluded that GDP has a negative relationship with non-performing loan which indicates that higher GDP leads to increase the income of people and lower the non-performing loan. In addition, Anjom and Karim (2016) found that GDP has a negative impact on non-performing loan. Every developed and sound financial institution has got the ability to absorb economic jolts and keep the economic system on track (Aburime, 2009).

Amuakwa-Mensah and Boakye-Adjei (2015) examined the determinants of non-performing loans in Ghana banking industry. The study found that exchange rate has a significant relation with non-performing loans of the banking industry. Similarly, Farhan et al. (2012) concluded that exchange rate has a positive relationship with non-performing loan which indicates that increase exchange rate leads to increase in non-

performing loan. Likewise, Mustafa et al. (2004) analyzed the volatility of exchange rate and export growth in Pakistan. The study showed that exchange rate has a positive and significant impact on non-performing loans. Moreover, Greenidge and Grosvenor (2010) reported that exchange rate has a positive relationship with non-performing loan. In addition, money supply has a positive and significant relationship with non-performing loan (Morakinyo and Sibanda, 2016). Constant and Ngoms (2012) examined the long-term lending behavior of 35 commercial banks in Central Africa. The study discovered that the gross domestic product has a positive and significant relationship with the bank lending. Furthermore, Roy et al. (2014) assessed the non-performing loans in private commercial banks of Bangladesh. The study found that the inflation has a direct impact on non-performing loans. Similarly, Hoggarth et al. (2005) found that inflation has a positive relationship with the non-performing loans. Likewise, Ombaba (2013) found that there is a significant negative relationship between inflation rate and non-performing loans. In addition, Curak et al. (2013) found that higher interest rate is associated with higher non-performing loan. Moreover, Abdioglu (2016) stated that interest rate to loans has a positive effect on non-performing loan. Yunusa et al. (2020) investigated the impact of monetary variables on bank lending in Nigeria. The study revealed that liquidity ratio and money supply have negative insignificant effect on loans and advances. Furthermore, Adebola et al. (2011) assessed the determinants of nonperforming loans in Islamic banking system in Malaysia. The study showed that interest rate has a significant positive long-term effect on credit risk. In addition, Ouhibi et al. (2017) found that high interest is exposed to higher rate of loan defaults.

Badar and Javid (2013) revealed that higher inflation rate results in higher non-performing loans in commercial banks of Pakistan. Moreover, Haniifah (2019) assessed the economic determinants of non-performing loans in Ugandan commercial banks. The study found that inflation rate has a negative but statistically insignificant effect on non-performing loans. Furthermore, Szarowska (2018) examined the effect of macroeconomic determinants on non-performing loans in Central and Eastern European countries confirmed a negative influence of inflation and exchange rate on non-performing loans. Likewise, Ekanayake and Athambawa (2015) found that market lending rate has a significant positive relationship with non-performing loans. In addition, remittance has a positive impact on non-performing loans. Similarly, Turan and Koskija (2014) found that remittances have a negative correlation with non-performing loan in the context of Albania. In addition, rising unemployment rates are considered a symptom of an economic recession phase. Moreover, Vatansever and Hepsen (2013) found that unemployment rate has a positive long-term effect on non-performing loans ratio. Furthermore, Makri (2014) found that there is a positive and significant relationship between unemployment and non-performing loans. Moreover, Amidu and Wolfe (2008) analysed the constrained implication of monetary policy on bank lending in Ghana between 1998 and 2004. The study revealed that the central bank prime rate and inflation rate negatively affect bank lending. Similarly, Misra and Sarat (2010) stated that interest rate has a positive and significant influences on non-performing loans.

Messai and Jouini (2013) concluded that interest rate has a positive and significant impact on non-performing loans. Likewise, Qwader (2019) examined the relationship between macroeconomic variables and their impact on non-performing loans in Jordanian banks. The study stated that remittances have an insignificant relationship with non-performing loans. In addition, Louzis et al. (2012) assessed the macroeconomic and bank-specific determinants of non-performing loans in Greece. The study found that unemployment rate has a positive relation with non-performing loans. Similarly, Roman and Bilan (2015) analyzed the macroeconomic determinants of non-performing loans in EU28 banking sector. The study concluded that unemployment rate has a positive relationship with non-performing loans. Similarly, Rusli and Rokhim (2012) examined the macroeconomics factors and bank lending behaviour In Indonesia. The



study concluded that a slumping exchange rate of Rupiah brought Indonesian businesses to hold off their business expansion plan due to the escalating risk. This situation ultimately slumps the demand for credit from financial institutions. Moreover, Dimitrios et al. (2016) found that unemployment has a significant positive influence on level of non-performing loans. In addition, Vatansever and Hepser (2015) found that unemployment rate has a positive effect on non-performing loan. Gabeshi (2017) found that exchange rate has a positive and significant effect on non-performing loans. Moreover, bankers also perceive that borrower's honesty in disclosing the information, better monitoring and evaluation of the loan have a significant negative impact on non-performing loan.

In the context of Nepal, Bhattarai (2018) found that gross domestic product (GDP) has a positive associated with non-performing loans (NPLs). Ojha (2018) found that there is a negative and significant relationship between gross domestic product (GDP) and non-performing loans. Moreover, Singh et al. (2021) examined the effect of non-performing loan on profitability in the context of Nepalese commercial banks. The study showed that inflation has a positive and significant impact on non-performing loan.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of macro-economic factors on non-performing loans. 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 macro-economic factors on the non-performing loans of Nepalese commercial banks. Specifically, it examines the relationship of gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate with non-performing loans and loan loss provision 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 20 commercial banks out of 27 commercial banks on the basis of loans and advances for the period from 2013/14 to 2020/21, leading to a total of 160 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|-------------------------|-------------------------------|-----------------|--------------|
| <b>A. Private banks</b> |                               |                 |              |
| 1                       | Global IME Bank Limited       | 2013/14-2020/21 | 8            |
| 2                       | Siddhartha Bank Limited       | 2013/14-2020/21 | 8            |
| 3                       | Nepal Investment Bank Limited | 2013/14-2020/21 | 8            |
| 4                       | Prime Commercial Bank Limited | 2013/14-2020/21 | 8            |
| 5                       | Kumari Bank Limited           | 2013/14-2020/21 | 8            |



|                                     |                                       |                 |            |
|-------------------------------------|---------------------------------------|-----------------|------------|
| 6                                   | Prabhu Bank Limited                   | 2013/14-2020/21 | 8          |
| 7                                   | Mega Bank Nepal Limited               | 2013/14-2020/21 | 8          |
| 8                                   | Machhapuchhre Bank Limited            | 2013/14-2020/21 | 8          |
| 9                                   | Citizens Bank International Limited   | 2013/14-2020/21 | 8          |
| 10                                  | Laxmi Bank Limited                    | 2013/14-2020/21 | 8          |
| 11                                  | Sunrise Bank Limited                  | 2013/14-2020/21 | 8          |
| 12                                  | Bank of Kathmandu Limited             | 2013/14-2020/21 | 8          |
| 13                                  | Century Commercial Bank Limited       | 2013/14-2020/21 | 8          |
| <b>B. Public banks</b>              |                                       |                 |            |
| 1                                   | Agricultural Development Bank Limited | 2013/14-2020/21 | 8          |
| 2                                   | Nepal Bank Limited                    | 2013/14-2020/21 | 8          |
| <b>C. Joint venture banks</b>       |                                       |                 |            |
| 1                                   | Nabil Bank Limited                    | 2013/14-2020/21 | 8          |
| 2                                   | NMB Bank Limited                      | 2013/14-2020/21 | 8          |
| 3                                   | Everest Bank Limited                  | 2013/14-2020/21 | 8          |
| 4                                   | Standard Chartered Bank Nepal Limited | 2013/14-2020/21 | 8          |
| 5                                   | Nepal Bangladesh Bank Limited         | 2013/14-2020/21 | 8          |
| <b>Total number of observations</b> |                                       |                 | <b>160</b> |

Thus, the study is based on the 160 observations.

## The model

The model used in this study assumes that the non-performing loans depends upon macro-economic factors. The dependent variables selected for the study are non-performing loans and loan loss provision. Similarly, the selected independent variables are gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate. Therefore, the model takes the following form:

$$\begin{aligned}
 NPL_{it} &= \beta_0 + \beta_1 GDP_{it} + \beta_2 XR_{it} + \beta_3 MS_{it} + \beta_4 INF_{it} + \beta_5 IR_{it} + \beta_6 RA_{it} + \beta_7 UE_{it} + e_{it} \\
 LLP_{it} &= \beta_0 + \beta_1 GDP_{it} + \beta_2 XR_{it} + \beta_3 MS_{it} + \beta_4 INF_{it} + \beta_5 IR_{it} + \beta_6 RA_{it} + \beta_7 UE_{it} + e_{it}
 \end{aligned}$$

Where,

- NPL = Nonperforming loans as measured by the ratio of non-performing loan to total loans, in percentage.
- LLP = Loan loss provision as measured by the ratio of loan loss provisions to total loans, in percentage.
- GDP = Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion.
- EXR = Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD.
- MS = Money supply as measured by the broad money, USD in billion.
- INF = Inflation rate as measured by the change in consumer price index, in percentage.
- IR = Interest rate as measured by the lending cost of the bank, in percentage.
- RA = Remittances measured as money sent from abroad, Rs in billion.
- UE = Unemployment rate measured as labour force without a job, in percentage.

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

## Gross domestic product (GDP)

Gross domestic product is defined as the measurement of the total market value of the goods or services produced by the economy of a particular country as well as total income earned by the people living at that country. Adeola and Ikpesu (2017) investigated the relationship between non-performing loans and economic growth in the context of Nigeria. The study found that economic growth and non-performing loans are negatively related. Similarly, Ofori-Abebrese et al. (2016) analyzed the macroeconomic factors and the performance of loans of commercial banks in Ghana. The study showed that GDP growth rate has a negative relationship with the non-performing loans. In addition, Kastrati (2011) concluded that GDP growth has a significant negative impact on non-performing loan. Furthermore, Zheng (2019) found a negative impact of GDP on loan loss provision dynamics. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a negative relationship of gross domestic product with non-performing loan and loan loss provision.

## Exchange rate

Zia and Huma (2015) showed that there is a significant relationship between exchange rate and non-performing loans. Likewise, Tanaskovic and Jandric (2015) found that exchange rate is positively related to non-performing loans ratio and are statistically significant. In addition, Adusei (2018) examined the determinants of non-performing loans in the banking sector of Ghana between 1998 and 2013. The study showed that exchange rate has a positive and significant effect on non-performing loan. Similarly, Khemraj and Pasha (2009) found that exchange rate has a significant positive impact on loan loss provision. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a positive relationship of exchange rate with non-performing loan and loan loss provision.

## Money supply

Adusei and Bannerman (2022) examined the non-performing loans of the Ghana banking sector between 1998 and 2019. The study found that money supply, financial development, and macroeconomics variables have a significant effect on non-performing loans. The study also showed a positive association between non-performing loans and money supply. Similarly, Osunnaiye and Alymkulova (2022) investigated the impact of non-performing loans on Nigerian economic growth. The study found bivariate co-integration between non-performing loan and money supply. Likewise, Salem et al. (2020) examined the relationship between non-performing loans and credit frictions of banking sector in Tunisia. The study showed that money supply is positively related to the non-performing loan ratio. In addition, Polat (2018) revealed that money supply has a positive relationship with loan loss provision. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a positive relationship of money supply with non-performing loan and loan loss provision.

## Inflation rate

Kjosevski and Petkovski (2017) investigated the determinants and macroeconomic effects on non-performing loans in Baltic States. The study found that inflation rate has a negative correlation with

non-performing loans. Similarly, Mazreku et al. (2018) found that inflation showed a significant negative relationship with loan loss provision. Likewise, Szarowska (2018) confirmed a negative influence of inflation rate on non-performing loans. In addition, Hosen and Muhari (2019) assessed the non-performing financing of Islamic rural bank industry in Indonesia. The study found that inflation has a statistically significant and negative relationship with non-performing loans. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a negative relationship of inflation with non-performing loan and loan loss provision.

## Interest rate

Siddiqui et al. (2012) examined the impact of interest rate volatility on non-performing loans in Pakistan. The study revealed that interest rate has a positive and significant relationship with non-performing loans. Similarly, Sheefeni (2015) examined the impact of macroeconomic determinants on non-performing loans in Namibia. The study explained that an increase in lending interest rate worsen debt burden as a result of increased interest payment, resulting in high number of non-performing loans. Likewise, Ekanayake and Athambawa (2015) found that market lending rate has a significant and positive relationship with non-performing loans. In addition, Rajha (2017) showed that interest rate has a positive and statistically significant relation with loan loss provision. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a positive relationship of interest rate with non-performing loan and loan loss provision.

## Remittances

San (2016) analyzed the effects of the changes in some macroeconomic indicators on the non-performing loans in the Albanian banking sector during 2007–2014. showed that non-performing loans has a negative correlation with remittances. Similarly, Wairimu and Esther (2017) assessed the macroeconomic determinants of non-performing loans in Kenya. The study asserted that remittances have a negative relation with non-performing loans. Likewise, Clichici and Tatiana (2014) assessed the impact of macroeconomic factors on non-performing loans in the Republic of Moldova. The study concluded that remittances have a negative impact on non-performing loans. In addition, Komoni et al. (2022) found that remittances have a negative association with loan loss provision. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a negative relationship of remittances with non-performing loan and loan loss provision.

## Unemployment rate

Kjosevski and Petkovski (2017) showed that unemployment has a positive and statistically significant impact on non-performing loans. Similarly, Tanaskovic and Jandric (2015) found that unemployment rate has a positive and significant relationship with non-performing loans. Likewise, Kjosevski et al. (2019) examined the bank-specific and macroeconomic determinants of non-performing loans in the Republic of Macedonia. The study showed that rate of unemployment has a positive and statistically significant impact on non-performing loans. In addition, Kozaric and Dzelihodzic (2020) revealed that unemployment rate has a positive and significant association with loan loss provision. Based on it, this study develops the following hypothesis.

H<sub>7</sub>: There is a positive relationship of unemployment rate with non-performing loan and loan loss provision.

### 3. Results and discussion

#### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 20 Nepalese commercial banks for the study period of 2013/14 to 2020/21. The dependent variables are NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage) and LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage). The independent variables are GDP (Gross domestic product measured by sum of consumption, Government expenditure, investment and net export, in USD), XR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), MS (Broad Money supply measured by the ratio of broad money supply to GDP in percentage), INF (Inflation rate measured by current consumer price index minus initial consumer price index by current consumer price index in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage), RA (Remittance measured by remittance inflow to GDP, Rs. in billion) and UE (Unemployment rate measured by number of people without job, in percentage).

| Variables | Minimum | Maximum | Mean   | Std. Deviation |
|-----------|---------|---------|--------|----------------|
| NPL       | 0.10    | 5.46    | 1.48   | 1.12           |
| LLP       | 0.20    | 8.46    | 2.22   | 1.14           |
| GDP       | 20.00   | 34.27   | 28.81  | 5.66           |
| XR        | 97.93   | 117.73  | 107.58 | 6.96           |
| MS        | 15.50   | 21.80   | 18.64  | 1.98           |
| INF       | 3.60    | 9.93    | 6.15   | 2.23           |
| IR        | 8.43    | 12.47   | 10.44  | 1.38           |
| RA        | 388.46  | 879.00  | 694.05 | 172.07         |
| UE        | 2.85    | 4.44    | 3.22   | 0.52           |

Source: SPSS output

#### Correlation analysis

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

**Table 3:** Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 20 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage) and LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage). The independent variables are GDP (Gross domestic product measured by sum of consumption, Government expenditure, investment and net export, in USD), XR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), MS (Broad Money supply measured by the ratio of broad money supply to GDP in percentage), INF (Inflation rate measured by current consumer price index minus initial consumer price index by current consumer price index in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage), RA (Remittance measured by remittance inflow to GDP, Rs. in billion) and UE (Unemployment rate measured by number of people without job, in percentage).

| Variables | NPL     | LLP | GDP | XR | MS | INF | IR | RA | UE |
|-----------|---------|-----|-----|----|----|-----|----|----|----|
| NPL       | 1       |     |     |    |    |     |    |    |    |
| LLP       | 0.913** | 1   |     |    |    |     |    |    |    |

|            |          |          |          |          |          |          |          |         |   |
|------------|----------|----------|----------|----------|----------|----------|----------|---------|---|
| <b>GDP</b> | -0.269** | -0.242** | 1        |          |          |          |          |         |   |
| <b>XR</b>  | -0.190*  | -0.163*  | 0.848**  | 1        |          |          |          |         |   |
| <b>MS</b>  | 0.060    | 0.090    | -0.169*  | 0.002    | 1        |          |          |         |   |
| <b>INF</b> | 0.218**  | 0.193*   | -0.803** | -0.532** | 0.170*   | 1        |          |         |   |
| <b>IR</b>  | -0.092   | -0.121   | 0.277**  | -0.200*  | -0.670** | -0.391** | 1        |         |   |
| <b>RA</b>  | -0.265** | -0.233** | 0.937**  | 0.951**  | -0.156*  | -0.635** | 0.035    | 1       |   |
| <b>UE</b>  | 0.002    | 0.001    | 0.424**  | 0.672**  | 0.205**  | -0.129   | -0.414** | 0.518** | 1 |

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

Table 3 shows that gross domestic product is negatively correlated to non-performing loan. It indicates that increase in gross domestic product leads to decrease in non-performing loan. Similarly, exchange rate has a negative relationship with non-performing loan. It indicates that increase in exchange rate leads to decrease in non-performing loan. Moreover, money supply has a positive relationship with non-performing loan. It indicates that increase in money supply leads to increase in non-performing loan. Furthermore, there is a positive relationship between inflation and non-performing loan. It indicates that increase in inflation leads to increase in non-performing loan. In addition, interest rate has a negative relationship with non-performing loan. It means that increase the interest rate leads to decrease in non-performing loan. Similarly, remittance has a negative relationship with non-performing loan. It indicates that increase the remittance leads to decrease in non-performing loan. Moreover, unemployment rate has a positive relationship with non-performing loan. It indicates that increase the unemployment rate leads to increase in non-performing loan of Nepalese commercial banks.

Similarly, the result also shows that there is a negative relationship between gross domestic product and loan loss provision. It indicates that increase the gross domestic product leads to decrease in loan loss provision. Similarly, exchange rate is negatively correlated to loan loss provision. It indicates that increase the exchange rate leads to decrease in loan loss provision. Moreover, money supply has a positive relationship with loan loss provision. It leads to increase in money supply leads to increase in loan loss provision. Furthermore, inflation has a positive relationship with loan loss provision. It means increase in inflation leads to increase in loan loss provision. In addition, interest rate has a positive relationship with loan loss provision. It indicates that increase in interest rate leads to increase in loan loss provision. Similarly, there is a negative relationship between remittance and loan loss provision. It leads to increase in remittance leads to decrease in loan loss provision. In addition, there is positive relationship between unemployment rate and loan loss provision. It means that increase in unemployment rate leads to increase in loan loss provision of Nepalese commercial banks.

## 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 gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate with non-performing loans of Nepalese commercial banks.

**Table 4:** Estimated regression results of gross domestic product, exchange rate, money supply, inflation rate, interest rate, remittances and unemployment rate with non-performing loans

The results are based on panel data of 20 commercial banks with 160 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is  $NPL_i = \beta_0 + \beta_1 GDP_i + \beta_2 XR_i + \beta_3 MS_i + \beta_4 INF_i + \beta_5 IR_i + \beta_6 RA_i + \beta_7 UE_i + e_i$  where, the dependent variable is NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage). The independent variables are GDP (Gross domestic product measured by sum of consumption, Government expenditure, investment and net export, in USD), XR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), MS (Broad Money supply measured by the ratio of broad money supply to GDP in percentage), INF (Inflation rate measured by current consumer price index minus initial consumer price index by current consumer price index in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage), RA (Remittance measured by remittance inflow to GDP, Rs. in billion) and UE (Unemployment rate measured by number of people without job, in percentage).

| Model | Intercept          | Regression coefficients of |                    |                  |                    |                   |                     |                   | Adj. R <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|--------------------|------------------|--------------------|-------------------|---------------------|-------------------|---------------------|-------|---------|
|       |                    | GDP                        | XR                 | MS               | INF                | IR                | RA                  | UE                |                     |       |         |
| 1     | 3.008<br>(6.774)** | -0.053<br>(3.508)**        |                    |                  |                    |                   |                     |                   | 0.066               | 1.080 | 12.309  |
| 2     | 4.763<br>(3.520)** |                            | -0.031<br>(2.431)* |                  |                    |                   |                     |                   | 0.030               | 1.101 | 5.912   |
| 3     | 0.850<br>(1.014)   |                            |                    | 0.034<br>(0.755) |                    |                   |                     |                   | 0.003               | 1.119 | 0.570   |
| 4     | 0.807<br>(3.172)** |                            |                    |                  | 0.109<br>(2.808)** |                   |                     |                   | 0.041               | 1.094 | 7.882   |
| 5     | 2.256<br>(3.335)** |                            |                    |                  |                    | -0.074<br>(1.158) |                     |                   | 0.002               | 1.117 | 1.340   |
| 6     | 2.673<br>(7.504)** |                            |                    |                  |                    |                   | -0.002<br>(3.452)** |                   | 0.064               | 1.081 | 11.919  |
| 7     | 1.467<br>(2.609)*  |                            |                    |                  |                    |                   |                     | 0.004<br>(0.023)  | 0.006               | 1.121 | 0.001   |
| 8     | 1.311<br>(0.706)   | -0.076<br>(2.654)*         | -0.022<br>(0.940)  |                  |                    |                   |                     |                   | 0.066               | 1.080 | 6.592   |
| 9     | 1.341<br>(0.703)   | -0.077<br>(2.528)*         | -0.022<br>(0.921)  | 0.003<br>(0.073) |                    |                   |                     |                   | 0.060               | 1.084 | 4.369   |
| 10    | 1.425<br>(0.742)   | -0.094<br>(1.946)          | -0.028<br>(1.024)  | 0.005<br>(0.111) | 0.034<br>(0.454)   |                   |                     |                   | 0.055               | 1.087 | 3.311   |
| 11    | 1.935<br>(2.839)** | -0.015<br>(0.249)          |                    |                  |                    |                   | -0.002<br>(1.218)   | 0.398<br>(2.019)* | 0.080               | 1.072 | 5.601   |
| 12    | -14.758<br>(1.700) | -0.117<br>(0.656)          | -0.175<br>(2.279)* | 0.044<br>(0.365) | 0.027<br>(0.269)   | -0.313<br>(1.008) | -0.005<br>(1.166)   | 0.187<br>(0.624)  | 0.089               | 1.067 | 3.209   |

**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 loans is the dependent variable.

Table 4 shows that the beta coefficients for 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 similar to the findings of Kastrati (2011). Similarly, the beta coefficients for exchange rate are negative with non-performing loan. It indicates that exchange rate has a negative impact on non-performing loan. This finding is similar to the findings of Tanaskovic and Jandric (2015). However, the beta coefficients for money supply are positive with non-performing loan. It indicates that money supply has a positive

impact on non-performing loan. This finding is similar to the findings of Osunnaiye and Alymkulova (2022). Likewise, the beta coefficients for inflation are positive with non-performing loan. It indicates that inflation has a positive impact on non-performing loan. This finding is similar to the findings of Szarowska (2018). Similarly, the beta coefficients for interest rate are negative with non-performing loan. It indicates that interest rate has a negative impact on non-performing loan. This finding is similar to the findings of Rajha (2017). Likewise, the beta coefficients for remittance are negative with non-performing loan. It indicates that remittance has a negative impact on non-performing loan. This finding is similar to the findings of Clichici and Tatiana (2014).

Table 5 shows the estimated regression results of gross domestic product, exchange rate, money supply, inflation, interest rate, remittance and unemployment rate on loan loss provision of Nepalese commercial banks.

**Table 5:** Estimated regression results of gross domestic product, exchange rate, money supply, inflation, interest rate, remittance and unemployment rate with loan loss provision

The results are based on panel data of 20 commercial banks with 160 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is  $LLP_{it} = \beta_0 + \beta_1 GDP_{it} + \beta_2 XR_{it} + \beta_3 MS_{it} + \beta_4 INF_{it} + \beta_5 IR_{it} + \beta_6 RA_{it} + \beta_7 UE_{it} + e_{it}$  where, the dependent variable is LLP (Loan loss provision as measured by the ratio of loan loss provision to total loans, in percentage). The independent variables are GDP (Gross domestic product measured by sum of consumption, Government expenditure, investment and net export, in USD), XR (Exchange rate as measured by exchange rate on the last day of the each reporting fiscal year, in NPR/USD), MS (Broad Money supply measured by the ratio of broad money supply to GDP in percentage), INF (Inflation rate measured by current consumer price index minus initial consumer price index by current consumer price index in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage), RA (Remittance measured by remittance inflow to GDP, Rs. in billion) and UE (Unemployment rate measured by number of people without job, in percentage).

| Model | Intercept          | Regression coefficients of |                    |                  |                   |                   |                     |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|--------------------|------------------|-------------------|-------------------|---------------------|------------------|-------------------------|-------|---------|
|       |                    | GDP                        | XR                 | MS               | INF               | IR                | RA                  | UE               |                         |       |         |
| 1     | 3.624<br>(7.934)** | -0.049<br>(3.132)**        |                    |                  |                   |                   |                     |                  | 0.052                   | 1.111 | 9.809   |
| 2     | 5.097<br>(3.672)** |                            | -0.027<br>(2.077)* |                  |                   |                   |                     |                  | 0.020                   | 1.129 | 4.312   |
| 3     | 1.254<br>(1.469)   |                            |                    | 0.052<br>(1.138) |                   |                   |                     |                  | 0.002                   | 1.140 | 1.295   |
| 4     | 1.612<br>(6.172)** |                            |                    |                  | 0.099<br>(2.475)* |                   |                     |                  | 0.031                   | 1.123 | 6.128   |
| 5     | 3.270<br>(4.751)** |                            |                    |                  |                   | -0.101<br>(1.538) |                     |                  | 0.009                   | 1.136 | 2.366   |
| 6     | 3.292<br>(8.975)** |                            |                    |                  |                   |                   | -0.002<br>(3.010)** |                  | 0.048                   | 1.113 | 9.060   |
| 7     | 2.217<br>(3.862)** |                            |                    |                  |                   |                   |                     | 0.001<br>(0.006) | 0.006                   | 1.145 | 0.001   |
| 8     | 1.712<br>(0.896)   | -0.074<br>(2.533)*         | -0.025<br>(1.031)  |                  |                   |                   |                     |                  | 0.053                   | 1.110 | 5.438   |
| 9     | 1.556<br>(0.794)   | -0.071<br>(2.270)*         | -0.022<br>(0.883)  | 0.018<br>(0.374) |                   |                   |                     |                  | 0.048                   | 1.113 | 3.652   |
| 10    | 1.659<br>(0.840)   | -0.091<br>(1.849)*         | -0.029<br>(1.032)  | 0.015<br>(0.326) | 0.041<br>(0.540)  |                   |                     |                  | 0.043                   | 1.116 | 2.799   |
| 11    | 3.060<br>(2.113)*  | -0.037<br>(0.534)          |                    |                  | 0.022<br>(0.265)  |                   | -0.001<br>(0.623)   | 0.358<br>(1.706) | 0.052                   | 1.111 | 3.198   |
| 12    | -8.138<br>(0.901)  | -0.038<br>(0.203)          | -0.129<br>(1.612)  | 0.006<br>(0.045) | 0.008<br>(0.079)  | -0.109<br>(0.337) | -0.006<br>(1.159)   | 0.081<br>(0.258) | 0.052                   | 1.111 | 2.248   |

**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. Loan loss provision is the dependent variable.

Table 5 shows that the beta coefficients for gross domestic product are negative with loan loss provision. It indicates that gross domestic product has a negative impact on loan loss provision. This finding is similar to the findings of Ofori-Abebrese et al. (2016). Similarly, the beta coefficients for exchange rate are negative with loan loss provision. It indicates that exchange rate has a negative impact on loan loss provision. This finding is similar to the findings of Adusei (2018). However, the beta coefficients for money supply are positive with loan loss provision. It indicates that money supply has a positive impact on loan loss provision. This finding is similar to the findings of Polat (2018). Likewise, the beta coefficients for inflation are positive with loan loss provision. It indicates that inflation has a positive impact on loan loss provision. This finding is similar to the findings of Kjosevski and Petkovski (2017). Similarly, the beta coefficients for interest rate are negative with loan loss provision. It indicates that interest rate has a negative impact on loan loss provision. This finding is similar to the findings of Ekanayake and Athambawa (2015). Likewise, the beta coefficients for remittance are negative with loan loss provision. It indicates that remittance has a negative impact on loan loss provision. This finding is similar to the findings of Komoni et al. (2022). In addition, the beta coefficients for unemployment rate are positive with loan loss provision. It indicates that unemployment rate has a positive impact on loan loss provision. This finding is similar to the findings of Kozaric and Dzelihodzic (2020).

## 4. Summary and conclusion

Non-performing loan (NPL) is the situation in which the borrower is in default and hasn't made any scheduled payments of principal or interest for a certain period of time. In banking, commercial loans are considered non-performing if the borrower is 90 days past due. Increase in NPLs rate is referred often as the failure of credit policy too.

This study attempts to analyze the impact of macro-economic factors on the non-performing loans of Nepalese commercial banks. The study is based on secondary data of 20 commercial banks with 160 observations for the period from 2013/14 to 2020/21.

The study showed that gross domestic product, exchange rate, interest rate and remittances have negative impact on non-performing loans. However, money supply, inflation rate and unemployment rate have positive impact on non-performing loans. Likewise, gross domestic product, exchange rate, interest rate and remittances have negative impact on loan loss provision. However, money supply, inflation rate and unemployment rate have positive impact on loan loss provision. Likewise, the study concluded that gross domestic product followed by the remittances and unemployment rate is the most influencing factor that explains the non-performing loan of Nepalese commercial banks. However, the study also concluded that the most dominant factor that determines the loan loss provision is gross domestic product followed by remittances and money supply in the context of Nepalese commercial banks.



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## Abstract

*The study examines the impact of interest rate spread on the profitability of Nepalese commercial banks. Return on assets and return on equity are selected as the dependent variables. The selected independent variables are spread rate, credit risk, bank size, net interest margin, GDP and inflation. The study is based on secondary data of 20 commercial banks with 140 observations for the study period from 2013/14 to 2019/20. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, publications and websites of Nepal Rastra Bank (NRB), Ministry of Finance (MoF) 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 increase in interest rate spread leads to increase in return on assets and return on equity. Similarly, credit risk has a negative impact on return on assets and return on equity. It indicates that increase in credit risk leads to decrease in 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. The study also showed that bank size has a positive impact on return on assets and return on equity. It reveals that larger the bank size, higher would be the return on assets and return on equity. The study also showed that GDP has a positive impact on return on assets. It reveals that higher the GDP growth rate, higher would be the return on assets. Moreover, inflation has a negative impact on return on assets. It indicates that higher the inflation rate, lower would be the return on assets.*

**Keywords:** Return on assets and return on equity, are spread rate, credit risk, bank size, net interest margin, GDP and inflation.

# 1. Introduction

Interest rate is one of the key determinants of banks' profitability in many economies (Amidu, 2006). The efficiency and effectiveness of the financial system of a country affect its interest rates spread. The difference between the borrowed rate and the lending rate is called the spread. Interest rate spread is simply the difference between the lending rate and deposits rate of commercial banks in an economy (Kalsoom and Khurshid, 2016). Chand (2002) stated the several reasons for high interest rate spreads such as: lack of adequate competition, scale diseconomies due to small size of markets, high fixed and operating costs, high transportation costs of funds due to expensive telecommunications, existence of regulatory controls and perceived market risks. Interest rate spread has always been one of the most important and significant economic issues in different countries of the world. The high spread rate declares the problems in the regulatory environment of bank and asymmetry of information. In other words, higher spread rate can improve profitability of banking system, the depth of banking and financial stability with increased tolerance against negative shocks (Doliente, 2005). The high spread rate cannot always be a good indication of the efficiency of the banking system, but it may indicate inadequate regulation and banking system instability. If a bank is with poor performance, it tries to reduce lending interest rates in order to obtain a greater share of the market (Brock and Suarez, 2000). High spread rate indicates the low efficiency of the banking system and non-competitive market conditions. A positive relationship exists between spread rate and market structure that reflects the non-competitive pricing behavior in the centralized market. Market power hypothesis suggests that banks that have a large share of the market can get market power in pricing and a larger share of the market. High spread rate may be inappropriate because it causes the lack of intermediation. Low interest rate on deposits would be the cause of reduction in depositing. High Interest rates on loans, on the other hand increases the cost for investors. Hence, the high spread rate can be indicative of inefficiency in the banking system (Saunders and Schumacher, 2000).

Raza et al. (2013) examined the determinants of bank profitability in Pakistan using a sample of 18 banks over a 10-year period. The results showed a negative relationship between interest spread and bank profitability in Pakistan. In addition, Aremeu et al. (2013) assessed the determinants of bank profitability in Nigeria. The results of the study showed that interest spread is significantly associated with bank profitability in the long run but insignificant in the short run. Khan and Sattar (2014) examined the effect of interest spread on profitability of four major banks in Pakistan. The results of the correlation analysis revealed a positive and statistically significant relationship between interest spread and profitability. Likewise, Owusu-Antwi et al. (2017) investigated interest rates spread and profitability of commercial banks in Ghana using a sample of 28 banks. The results showed that bank spread affect profitability of commercial banks in Ghana positively but the relationship was statistically insignificant. The study also showed that there is a significant relationship between interest margin and banks profitability. Furthermore, Hosen (2020) examined internal factors influencing the profitability of commercial banks in Bangladesh. The results of the study showed that interest spread has a negative and statistically significant relationship with bank financial performance in Bangladesh. Musah et al. (2018) examined the effect of interest rate spread on the profitability of commercial banks in Ghana. The results of the study showed that there is a positive and statistically significant association between interest rate spread and bank profitability in Ghana.

Interest rates are major economic factors that influence the economic growth in an economy. Poor decisions on the rates can directly affect the economic performance in all industry but greatly on the financial sectors. Hancock (1985) confirmed that a higher level of market interest rates improves banking profitability. 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 (Angelini, 2000). More efficient banking system benefits the real economy by allowing higher expected returns for savers with a financial surplus, and lower borrowing costs for investing in new projects that need external finance. Therefore, if the banking sector's interest rate spread is large it discourages potential savers due to low returns on deposits and thus limits financing for potential borrowers (Tennant, 2006). A change in the interest rates affects the debt-equity choice of a firm, the overall cost of capital and real interest rates. It influences the desired level of the capital stock and its productivity as well as the availability of savings and consequent speed of adjustment of the actual capital stock to its desired level. Brewer et al. (1996) found that interest rate is one of the most important factors that affect the bank financial performance.

Interest rates are major economic factors that influence the economic growth in an economy. Hualan (1992) found that interest rate is one of the most important factors that affect the bank financial performance. The difference between the borrowed rate and the lending rate is called the spread. Commercial banks play a very crucial role in the allocation of economic resource by basically helping to channel funds from depositors to investors in a continuous manner (Ongore and Kusa, 2013). Spread is different from the interest rates because they are determined by the individual financial institution (Mlachila, 2002). Low rate or small spread helps the financial institution to remain competitive hence encouraged. A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Althanasoglou et al., 2008). Collins and Wanjau (2011) examined the effects of interest rate spread on the level of non-performing assets in commercial banks in Kenya. The study concluded that interest rate spread has significant effect on performing assets in banks as it increases the cost of loans charged on the borrowers. Similarly, Agyei (2011) found that smaller banks have narrow spread than big banks. Moreover, smaller and growing banks reduced the interest charged and also compensate savers fairly. Hence, narrow spread is indicated to motivate savings and hence boost economic performance.

In the context of Nepal, Bhattarai (2017) examined the determinants of interest rate spreads of commercial banks in Nepal. The study revealed that default risk, profitability and bank size have significant and positive impact on interest rate spreads. Cash reserve requirement has negligible effect on interest rate spreads. Similarly, Chalise (2019) assessed the impact of capital adequacy and cost-income ratio on the performance of Nepalese commercial banks. The study found that debt-equity ratio and bank size have positive insignificant impact on bank performance. Similarly, equity ratio has a positive and significant impact on bank performance. Furthermore, Koju et al. (2018) showed that NPLs have significant positive relationship with the export to import ratio, inefficiency, and assets size and a negative relationship with the GDP growth rate, capital adequacy, and inflation rate. Acharya et al. (2020) found that capital adequacy ratio has a positive impact on return on assets and return on equity. Further, non-performing loan ratio and loan loss provision have positive impact on return on assets and return on equity. The study concluded that non-performing loan ratio and loan loss provision are the most influencing factors that explains the change in the profitability of Nepalese commercial banks. Likewise, Budhathoki et al. (2020) found that capital adequacy ratio, loan loss provision and non-performing loan have a negative impact on return on assets. Further, the study found that bank size has a positive impact on return on assets.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of interest rate spread on the profitability of bank. 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 interest rate spread on profitability in commercial banks of Nepal. Specifically, it examines the relationship of spread rate, credit risk, bank size, net interest margin, GDP and inflation with 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 20 Nepalese commercial banks from 2013/14 to 2019/20, leading to a total of 140 observations. The main sources of data include publications and websites of Nepal Rastra Bank (NRB), Ministry of Finance (MoF), 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 commercial banks              | Study period     | Observations |
|-------------------------------------|---------------------------------------|------------------|--------------|
| 1                                   | Bank of Kathmandu Limited             | 2013/14 -2019/20 | 7            |
| 2                                   | Citizens Bank International Limited   | 2013/14 -2019/20 | 7            |
| 3                                   | Civil Bank Limited                    | 2013/14 -2019/20 | 7            |
| 4                                   | Everest Bank Limited                  | 2013/14 -2019/20 | 7            |
| 5                                   | Global IME Bank Limited               | 2013/14 -2019/20 | 7            |
| 6                                   | Himalayan Bank Limited                | 2013/14 -2019/20 | 7            |
| 7                                   | Kumari Bank Limited                   | 2013/14 -2019/20 | 7            |
| 8                                   | Laxmi Bank Limited                    | 2013/14 -2019/20 | 7            |
| 9                                   | Machhapuchchhre Bank Limited          | 2013/14 -2019/20 | 7            |
| 10                                  | Mega Bank Nepal Limited               | 2013/14 -2019/20 | 7            |
| 11                                  | Nabil Bank Limited                    | 2013/14 -2019/20 | 7            |
| 12                                  | Nepal SBI Bank Limited                | 2013/14 -2019/20 | 7            |
| 13                                  | NIC Asia Bank Limited                 | 2013/14 -2019/20 | 7            |
| 14                                  | NMB Bank Limited                      | 2013/14 -2019/20 | 7            |
| 15                                  | Prabhu Bank Limited                   | 2013/14 -2019/20 | 7            |
| 16                                  | Prime Commercial Bank Limited         | 2013/14 -2019/20 | 7            |
| 17                                  | Sanima Bank Limited                   | 2013/14 -2019/20 | 7            |
| 18                                  | Siddhartha Bank Limited               | 2013/14 -2019/20 | 7            |
| 19                                  | Standard Chartered Bank Nepal Limited | 2013/14 -2019/20 | 7            |
| 20                                  | Sunrise Bank Limited                  | 2013/14 -2019/20 | 7            |
| <b>Total number of observations</b> |                                       |                  | <b>140</b>   |

Thus, the study is based on the 140 observations.



## The model

The model used in this study assumes that the profitability of Nepalese commercial banks depends upon interest rate spread and other bank specific and macroeconomic factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are spread rate, credit risk, bank size, net interest margin, GDP and inflation. Therefore, the model takes the following form:

$$\begin{aligned}ROA_{it} &= \beta_0 + \beta_1 NIM_{it} + \beta_2 CR_{it} + \beta_3 BS_{it} + \beta_4 IRS_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it} + e_{it} \\ROE_{it} &= \beta_0 + \beta_1 NIM_{it} + \beta_2 CR_{it} + \beta_3 BS_{it} + \beta_4 IRS_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it} + e_{it}\end{aligned}$$

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.                  |
| NIM | = | Net interest margin as measured by the ratio of net interest income to total assets, in percentage.              |
| CR  | = | Credit risk as measured by the ratio of non-performing loan to total loan, in percentage.                        |
| BS  | = | Bank size as measured by the total assets of bank, Rs in billion.                                                |
| IRS | = | Interest rate spread as measured by the difference between deposit rate and lending rate of bank, in percentage. |
| GDP | = | Gross domestic product growth rate, in percentage.                                                               |
| INF | = | Inflation rate as measured by the consumer price index, in percentage.                                           |

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

## Credit risk

Noman et al. (2015) showed that credit risk has a negative relationship with the bank's profitability. Likewise, Kolapo et al. (2012) found a negative relationship between credit risk and the profitability in the context of Nigerian commercial banks. In addition, Kargi (2011) found that credit risk management has a significant impact on the profitability of Nigerian banks. The study also concluded that profitability is inversely influenced by the level of loans and advances and non-performing loans. In addition, Kishori and Sheeba (2017) showed a significant negative impact of credit risk on the profitability of commercial banks in India. Further, Kaaya and Pastory (2013) found that there is a negative impact of credit risk on the profitability of Tanzanian commercial banks. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a negative relationship of credit risk with bank profitability.

## Spread rate

Owusu-Antwi et al. (2017) revealed that bank spread has a positive effect on the profitability of commercial banks in Ghana. Similarly, Aremu et al. (2013) found that interest spread is significantly associated with bank profitability in the long run but insignificant in the short run. Likewise, Musah et al. (2018) found that there is a positive and statistically significant association between interest rate spread and bank profitability. Similarly, Khan and Sattar (2014) revealed that there is a significant positive relationship between interest spread and profitability. In addition, Ngugi (2001) argued that spread is core to bank performance and those banks which manage to keep wider spread perform better than other banks holding other factors

constant. Likewise, Karki (2020) revealed that there is a positive impact of interest rate spread on the profitability of banks. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between spread rate and bank profitability.

## Bank size

Bank size is defined as the total assets of an individual firm. Likewise, Kosmidou (2008) found that bank size is positively related to bank profitability. Further, Mule et al. (2015) concluded that there is a positive significant relationship between firm size and profitability. Hirindu (2017) proved that bank size is positive and statistically significant determinants of profitability. Likewise, Maina et al. (2019) showed that firm size as measured by customer deposits and loans advanced have a positive relationship with profitability of commercial banks in Kenya. Furthermore, Kapaya and Raphael (2016) argued that bank size has a positive impact on profitability measured by net interest margin and return on assets. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between bank size and bank profitability.

## Net interest margin (NIM)

Yohanna et al. (2014) stated that net interest margin is the ratio of net interest income to average earning assets. High net interest margin and profitability tend to be associated with banks that hold a relatively high amount of capital, and with large overheads (Ben Naceur and Goaied, 2008). Silaban (2017) examined the effect of capital adequacy ratio, net interest margin and non-performing loans on bank profitability in Indonesia. The results indicated that capital adequacy ratio does not have a significant effect on bank profitability. The result showed that net interest margin improves the growth of bank profitability. The greater the NIM achieved by the bank, the higher the interest income on earning assets managed by the bank concerned, thereby increasing the bank's profit (Raharjo et al., 2014). Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a positive relationship between net interest margin and bank profitability.

## Gross domestic product

Tan and Floros (2012) found that there is a positive and significant relationship between GDP and profitability of banks. Similarly, Simiyu and Ngile (2015) found that real GDP growth rate has a positive but insignificant effect on the ROA in the context of Nairobi. Likewise, Yuksel et al. (2018) found that that economic growth positively influences bank profitability. Further, Combey and Togbenou (2017) concluded that there is a positive and significant relationship between GDP and profitability of banks. Finally, Vejzagic and Zarafat (2014) revealed that there is a positive and statistically relationship between GDP and profitability of Malaysian banks. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a positive relationship between gross domestic product and bank profitability.

## Inflation

Boyd et al. (2001) showed that there is a significant negative relationship between inflation and performance of banking sector. In addition, Huybens and Smith (1999) argued that an increase in the rate of inflation have negative consequences on banking financial sector performance through credit market frictions. Similarly, Chioma et al. (2014) found there is a negative and insignificant relationship between inflation and bank profitability. Furthermore, Ishfaq and Khan (2015) revealed that there is a negative relationship between inflation and profitability of Pakistani commercial banks. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a negative relationship between inflation 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 2013/14 to 2019/20.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 20 Nepalese commercial banks for the study period from 2013/14 to 2019/20. 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 shareholder's equity, in percentage). The independent variables are NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), BS Bank size as measured by the total assets of bank, Rs in billion), IRS (Interest rate spread as measured by the difference between deposit rate and lending rate of bank, in percentage), GDP (Gross domestic product growth rate, in percentage) and INF (Inflation rate as measured by the consumer price index, in percentage).

| Variables | Minimum | Maximum | Mean  | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| ROA       | -1.44   | 2.69    | 1.58  | 0.54           |
| ROE       | -26.89  | 38.73   | 15.27 | 6.33           |
| IRS       | 2.29    | 7.09    | 4.11  | 0.65           |
| CR        | 0.02    | 24.29   | 1.46  | 2.18           |
| NIM       | 2.11    | 4.23    | 3.07  | 0.43           |
| BS        | 7.14    | 62.47   | 12.44 | 6.77           |
| GDP       | 0.01    | 7.70    | 4.54  | 2.57           |
| INF       | 4.20    | 9.90    | 6.57  | 2.13           |

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 20 Nepalese commercial banks for the study period of 2013/14 to 2019/20. 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 shareholder's equity, in percentage). The independent variables are NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), BS Bank size as measured by the total assets of bank, Rs in billion), IRS (Interest rate spread as measured by the difference between deposit rate and lending rate of bank, in percentage), GDP (Gross domestic product growth rate, in percentage) and INF (Inflation rate as measured by the consumer price index, in percentage).

| Variables | ROA      | ROE      | IRS     | CR       | NIM     | BS    | GDP    | INF |
|-----------|----------|----------|---------|----------|---------|-------|--------|-----|
| ROA       | 1        |          |         |          |         |       |        |     |
| ROE       | 0.584**  | 1        |         |          |         |       |        |     |
| IRS       | 0.239**  | 0.232**  | 1       |          |         |       |        |     |
| CR        | -0.546** | -0.599** | 0.037   | 1        |         |       |        |     |
| NIM       | 0.368**  | 0.230**  | 0.177*  | 0.023    | 1       |       |        |     |
| BS        | 0.073    | 0.165    | -0.202* | -0.026   | -0.021  | 1     |        |     |
| GDP       | 0.143    | -0.157   | -0.123  | 0.025    | 0.276** | 0.014 | 1      |     |
| INF       | -0.194*  | 0.130    | 0.035   | -0.519** | -0.124  | 0.020 | -0.120 | 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, credit risk is negatively correlated to return on assets. It indicates that increase in credit risk leads to decrease in return on assets. The net interest margin is positively correlated to return on assets. It indicates that increase in net interest margin leads to increase in return on assets. The study also shows that bank size is positively related to return on assets. It reveals that larger the bank size, higher would be the return on assets. The study also shows that GDP is positively related to return on assets. It reveals that higher the GDP growth rate, higher would be the return on assets. Moreover, the study also shows that inflation is negatively related to return on assets. It indicates that higher the inflation rate, lower would be the return on assets.

Similarly, the results show 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, credit risk is negatively correlated to return on equity. It indicates that increase in credit risk leads to decrease in return on equity. The net interest margin is positively correlated to return on equity. It indicates that increase in net interest margin leads to increase return on equity. The study also shows that bank size is positively related to return on equity. It reveals that larger the bank size, higher would be the return on equity. In contrast, GDP is negatively related to return on equity. It reveals that higher the GDP growth rate, lower would be the return on equity. Likewise, inflation is positively correlated to return on equity. It indicates that increase in inflation 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 interest rate spread, credit risk, bank size, net interest margin, GDP and inflation on return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of interest rate spread, credit risk, bank size, net interest margin, GDP and inflation on return on assets

This result is based on panel data of 20 commercial banks with 140 observations for the study period from 2013/14 to 2019/20 by using linear regression model. The model is  $ROA_i = \beta_0 + \beta_1 NIM_i + \beta_2 CR_i + \beta_3 BS_i + \beta_4 IRS_i + \beta_5 GDP_i + \beta_6 INF_i + e_i$ , 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 NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), BS Bank size as measured by the total assets of bank, Rs in billion), IRS (Interest rate spread as measured by the difference between deposit rate and lending rate of bank, in percentage), GDP (Gross domestic product growth rate, in percentage) and INF (Inflation rate as measured by the consumer price index, in percentage).

| Model | Intercept           | Regression coefficients of |                     |                    |                  |                  |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|---------------------|--------------------|------------------|------------------|--------------------|-------------------------|-------|---------|
|       |                     | IRS                        | CR                  | NIM                | BS               | GDP              | INF                |                         |       |         |
| 1     | 0.773<br>(2.722)**  | 0.197<br>(2.890)**         |                     |                    |                  |                  |                    | 0.050                   | 0.527 | 8.352   |
| 2     | 1.780<br>(38.463)** |                            | -0.135<br>(7.662)** |                    |                  |                  |                    | 0.293                   | 0.455 | 58.709  |
| 3     | 0.178<br>(0.582)    |                            |                     | 0.457<br>(4.654)** |                  |                  |                    | 0.129                   | 0.504 | 21.65   |
| 4     | 1.655<br>(17.243)** |                            |                     |                    | 0.006<br>(0.856) |                  |                    | 0.002                   | 0.541 | 0.733   |
| 5     | 1.446<br>(15.649)** |                            |                     |                    |                  | 0.030<br>(1.699) |                    | 0.013                   | 0.537 | 2.886   |
| 6     | 1.905<br>(13.037)** |                            |                     |                    |                  |                  | -0.049<br>(2.320)* | 0.031                   | 0.532 | 5.384   |
| 7     | 0.903<br>(3.858)*   | 0.214<br>(3.814)*          | -0.138<br>(8.167)** |                    |                  |                  |                    | 0.357                   | 0.433 | 39.510  |
| 8     | -0.208<br>(0.711)   | 0.164<br>(3.166)*          | -0.139<br>(9.092)** | 0.429<br>(5.518)** |                  |                  |                    | 0.470                   | 0.393 | 42.149  |
| 9     | -0.140<br>(0.4510)  | 0.157<br>(2.963)*          | -0.139<br>(9.084)** | 0.430<br>(5.516)** | 0.003<br>(0.658) |                  |                    | 0.468                   | 0.394 | 31.588  |
| 10    | -0.179<br>(0.577)   | 0.171<br>(3.195)**         | -0.140<br>(9.159)** | 0.393<br>(4.828)** | 0.003<br>(0.637) | 0.020<br>(1.474) |                    | 0.473                   | 0.392 | 25.925  |
| 11    | -0.253<br>(0.639)   | 0.174<br>(3.184)**         | -0.141<br>(8.856)** | 0.391<br>(4.748)** | 0.003<br>(0.581) | 0.025<br>(1.209) | -0.007<br>(0.302)  | 0.469                   | 0.394 | 21.473  |

**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 findings of Musah et al. (2018). Similarly, the beta coefficients for credit risk are negative with return on assets. It indicates that credit risk has a negative impact on return on assets. This finding is consistent with the findings of Kishori and Sheeba (2017). Moreover, 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 Silaban (2017). Likewise, 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 Kapaya and Raphael (2016). Likewise, the beta coefficients for GDP are positive with return on assets. It indicates that GDP growth rate has a positive impact on return on assets. This finding is similar to the findings of Yuksel et al. (2018).

The estimated regression results of interest rate spread, credit risk, bank size, net interest margin, GDP and inflation on return on equity of Nepalese commercial banks have been presented in Table 5.

**Table 5:** Estimated regression results of interest rate spread, credit risk, bank size, net interest margin, GDP and inflation on return on equity

This result is based on panel data of 20 commercial banks with 140 observations for the study period from 2013/14 to 2019/20 by using linear regression model. The model is  $ROE_{it} = \beta_0 + \beta_1 NIM_{it} + \beta_2 CR_{it} + \beta_3 BS_{it} + \beta_4 IRS_{it} + \beta_5 GDP_{it} + \beta_6 INF_{it} + e_{it}$  where the dependent variable is ROE (Return on equity as measured by the ratio of net income to shareholder's equity, in percentage). The independent variables are NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), CR (Credit risk as measured by the ratio of non-performing loan to total loan, in percentage), BS Bank size as measured by the total assets of bank, Rs in billion), IRS (Interest rate spread as measured by the difference between deposit rate and lending rate of bank, in percentage), GDP (Gross domestic product growth rate, in percentage) and INF (Inflation rate as measured by the consumer price index, in percentage).

| Model | Intercept           | Regression coefficients of |                     |                    |                  |                  |                    | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|---------------------|--------------------|------------------|------------------|--------------------|------------------------------------|-------|---------|
|       |                     | IRS                        | CR                  | NIM                | BS               | GDP              | INF                |                                    |       |         |
| 1     | 0.773<br>(2.722)**  | 0.197<br>(2.890)**         |                     |                    |                  |                  |                    | 0.050                              | 0.527 | 8.352   |
| 2     | 1.780<br>(38.463)** |                            | -0.135<br>(7.662)** |                    |                  |                  |                    | 0.293                              | 0.455 | 58.709  |
| 3     | 0.178<br>(0.582)    |                            |                     | 0.457<br>(4.654)** |                  |                  |                    | 0.129                              | 0.504 | 21.65   |
| 4     | 1.655<br>(17.243)** |                            |                     |                    | 0.006<br>(0.856) |                  |                    | 0.002                              | 0.541 | 0.733   |
| 5     | 1.446<br>(15.649)** |                            |                     |                    |                  | 0.030<br>(1.699) |                    | 0.013                              | 0.537 | 2.886   |
| 6     | 1.905<br>(13.037)** |                            |                     |                    |                  |                  | -0.049<br>(2.320)* | 0.031                              | 0.532 | 5.384   |
| 7     | 0.903<br>(3.858)*   | 0.214<br>(3.814)*          | -0.138<br>(8.167)** |                    |                  |                  |                    | 0.357                              | 0.433 | 39.510  |
| 8     | -0.208<br>(0.711)   | 0.164<br>(3.166)*          | -0.139<br>(9.092)** | 0.429<br>(5.518)** |                  |                  |                    | 0.470                              | 0.393 | 42.149  |
| 9     | -0.140<br>(0.4510)  | 0.157<br>(2.963)*          | -0.139<br>(9.084)** | 0.430<br>(5.516)** | 0.003<br>(0.658) |                  |                    | 0.468                              | 0.394 | 31.588  |
| 10    | -0.179<br>(0.577)   | 0.171<br>(3.195)**         | -0.140<br>(9.159)** | 0.393<br>(4.828)** | 0.003<br>(0.637) | 0.020<br>(1.474) |                    | 0.473                              | 0.392 | 25.925  |
| 11    | -0.253<br>(0.639)   | 0.174<br>(3.184)**         | -0.141<br>(8.856)** | 0.391<br>(4.748)** | 0.003<br>(0.581) | 0.025<br>(1.209) | -0.007<br>(0.302)  | 0.469                              | 0.394 | 21.473  |

#### Notes:

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

Table 5 shows that the beta coefficients for 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 Aremu et al. (2013). Similarly, the beta coefficients for credit risk are negative with return on equity. It indicates that credit risk has a negative impact on return on equity. This finding is consistent with the findings of Kolapo et al. (2012). 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 Ben Naceur and Goaied (2008). Similarly, 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 Hirindu (2017).

## 4. Summary and conclusion

Interest rate spread has always been one of the most important and significant economic issues in different countries of the world. The high spread rate declares the problems in the regulatory environment of bank and asymmetry of information. In other words, higher spread rate can improve profitability of banking system, the depth of banking and financial stability with increased tolerance against negative shocks. The high spread rate cannot always be a good indication of the efficiency of the banking system, but it may indicate inadequate regulation and banking system instability. If a bank is with poor performance, it tries to reduce lending interest rates in order to obtain a greater share of the market.

This study attempts to analyze the impact of interest rate spread on the profitability of Nepalese commercial banks. The study is based on secondary data of 20 commercial banks with 140 observations for the period from 2013/14 to 2019/20.

The study showed that interest rate spread, net interest margin and bank size have positive impact on return on assets and return on equity. However, credit risk has negative impact on return on assets and return on equity. The study concluded that credit risk followed by net interest margin and interest rate spread is the most influencing factor that explains the changes in the return on assets. Likewise, the study also concluded that the most dominant factor that determines the return on equity is credit risk followed by interest rate spread and net interest margin in the context of Nepalese commercial banks.

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## Abstract

*This study examines the effect of capital ratios on the risk, efficiency and profitability of Nepalese commercial banks. Return on assets, management efficiency and loan loss provision are selected as the dependent variables. Similarly, Tier 1 capital ratio, total assets, capital adequacy ratio, Tier 1 to total assets, net loan to total assets and assets growth are selected as the independent variables. This study is based on secondary data of 12 commercial banks with 108 observations for the study period from 2012/13 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of finance. The correlation coefficients and regression models are estimated to test the significance and importance of capital ratios on the risk, efficiency and profitability of Nepalese commercial banks.*

*The study showed that Tier 1 capital ratio has a positive impact on return on assets. It means that increase in Tier 1 capital ratio leads to increase in return on assets. Furthermore, Tier 1 to total assets has a positive impact on return on assets. It indicates that increase in Tier 1 to total assets leads to increase in return on assets. Similarly, assets growth ratio has a positive impact on return on assets. It indicates that increase in assets growth leads to increase in return on assets. Moreover, total assets have positive impact on return on assets. It means that larger the bank size, higher would be the return on assets. In addition, Tier 1 capital ratio has a negative impact on loan loss provision. It means that increase in Tier 1 capital ratio leads to decrease in loan loss provision. Furthermore, net loan to total assets has a negative impact on loan loss provision. It indicates that increase in net loan to total assets ratio leads to decrease in loan loss provision. Similarly, there is a negative impact of net loan to total assets on management efficiency. It indicates that increase in net loan to total assets ratio leads to decrease in management efficiency. Furthermore, assets growth has a positive impact on management efficiency. It indicates that increase in assets growth leads to increase in management efficiency.*

**Key words:** Return on assets, management efficiency, loan loss provision, net loan to total assets and assets growth.

# 1. Introduction

The financial sector plays an important role in the development of the country economy and financial inclusion. Strong financial institutions are critical for increased investment, economic growth, employment and poverty alleviation (Damodaran, 2013). Financial institutions are exposed to various risks in pursuit of their business objectives. The nature and complexity of which has changed rapidly over time. The failure to adequately manage these risks exposes financial institutions not only hampering the profitability as their earnings are converting in to bad debts but also increasing interest rate and causing economic slowdown. It ultimately rendered them unsuccessful in achieving their strategic business objectives. According to Torbira and Zaagha (2016), capital adequacy involves setting minimum requirements for market risk in the books of banks and investment companies. This includes specifying standards, covering risk management and solvency ratio requirements. According to Athanasoglou et al. (2008), bank profitability is the ability of a bank to generate revenue in excess of cost, in relation to the bank's capital base. A sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system. Profitability is the ability to make profit from the overall business activities. It indicates how efficient a company can earn a return from the use of its assets on a given investment. Capital prevails as insurance for depositors, regulatory authorities, and the general public to ensure that the bank is still on operation and be able to sustain in the market. For the depositor, capital adequacy also provides a confidence that the bank is safe and is able to pay them on demand regardless in the good or bad times (Mendoza and Rivera, 2017). Capital adequacy is a central issue of prudential regulation.

Anginer and Demircug-Kunt (2014) examined the relationship between bank capital and systemic stability. The study found that higher capital buffers make bank owners more prudent and wiser in their investment choices. Similarly, Lee and Hsieh (2013) assessed the relationship between capital and risk. The study showed a positive association between capital and efficiency. Furthermore, Blum (1999) stated that raising capital may eventually lead to increased risk. The study found that if it is too costly for a bank to increase its capital level to meet capital in the future, then the only solution for the bank in the present day is to increase the riskiness of its portfolio. Likewise, Tan et al. (2017) assessed the impact of risk, competition, and efficiency on banks profitability. The study found that credit risk significantly influences the profitability of the commercial banks. Moreover, Gropp et al. (2011) revealed that excessive credit expansion, poor lending quality and inappropriate credit risk management are the main reasons of recent global financial crisis. Similarly, Iannotta et al. (2007) examined the relationship between ownership structure, risk and performance in the European banking industry. The study found that banks with higher capital ratios are more profitable. The study also argued that more capitalized banks have better management quality and thus, higher income and lower costs.

Gebremichael and Ababa (2016) assessed the impact of capital structure on the profitability of commercial banks of Ethiopia. The study revealed that deposit ratio has a statistically significant and a positive relationship with profitability. Similarly, Suganya and Kengatharan (2018) examined the impact of bank internal factor on profitability of commercial bank in Sri Lanka. The study concluded that capital adequacy ratio has a significant and a positive effect on the bank's financial performance. In addition, Anggari and Dana (2020) found that the capital adequacy ratio, third party fund, and bank size have a positive and significant effect on bank profitability. According to Olarewaju and Akande (2016), there is a significant positive relationship between ROA and capital level among Nigerian banks. Shabani et al. (2019) examined the effect of capital adequacy on returns of assets of commercial banks in Kosovo. The study concluded that capital adequacy has a positive impact on return on assets. In addition, Onaolapo and Olufemi (2012)

reported that there is a positive and significant relationship between capital adequacy ratio and return on assets of the Nigerian banking sector.

Capital adequacy is a central issue of prudential regulation. Tan (2016) revealed that more capitalized banks are more profitable because they have higher credit worthiness, engage more in prudent lending, and borrow less, which reduces their costs and increases their profitability. Moreover, Banna et al. (2017) examined the banking industry in Bangladesh during 2000-2013. The study showed that bank size, capital adequacy ratio, equity return average, and interest rate have significant influence on bank efficiency in Bangladesh. Similarly, Rangkuti (2020) assessed the effects of Tier-1 capital to risk management and profitability on performance. The study found that tier-1 capital has a positive effect on profitability with risk management as a mediation variable and risk management has a positive direct effect on profitability. Moreover, Berger and Bouwman (2013) investigated the influence of capital ratio on bank performance during financial crises from 1984 to 2010 in the United States. The study found that small banks with higher capital ratios have a higher probability, market share and profitability both in 'normal' times and during financial crises.

Banna et al. (2019) assessed the relationship between NPL and bank efficiency in Malaysia and Singapore by using the Tobit regression model. The result stated that higher NPL reduces cost efficiency and also the lower cost efficiency increases NPL and profitability. Since capital adequacy ratio has positive effect on bank profitability, it can be instrumental in promoting bank soundness and safety (Agbeja et al., 2015). Sound capital base enable the bank to maximize profit, whereas poor capital base give birth to too many defects (Kleff and Weber, 2008). Furthermore, Rifqah and Hassan (2019) investigated the relationship between bank's credit risk, liquidity, and capital adequacy towards its profitability in Indonesia. The study showed that there is a significant negative relationship between net interest margin and return on asset. Moreover, Zhou and Wong (2008) indicated that there is a negative relationship between profitability and capital adequacy ratio. Furthermore, Roman and Danuletiu (2013) concluded that capital adequacy has a positive and direct relationship with bank profitability in Romania. Similarly, Isanzu (2017) showed that capital adequacy has a positive and significant effect on ROA of Chinese banks. In addition, Mathuva (2009) concluded that capital adequacy and bank's profitability are positively related. Furthermore, Molyneux and Thornton (1992) found that capital ratio has a positive impact on bank performance.

In the context of Nepal, Bhattarai (2016) investigated the effect of credit risk on the performance of Nepalese commercial banks. The study revealed that bank size has a significant and positive effect on bank performance. Similarly, capital adequacy ratio has a significant and positive effect on bank performance. Moreover, Budhathoki and Rai (2020) explored the impact of assets quality, capital adequacy ratio, assets diversification and operating efficiency on banks' profitability. The study indicated that three predictor variables namely; assets quality, operating efficiency, and capital adequacy ratio significantly affect bank profitability. Similarly, Pradhan and Parajuli (2017) examined the impact of capital adequacy and cost income ratio on performance of Nepalese commercial banks. The study revealed that capital adequacy ratio, cost income ratio, and equity capital to total assets have negative impact on return on assets. Moreover, Bhatt and Jain (2020) examined the relationship between the capital structure and the profitability of commercial Banks in Nepal. The study concluded that capital structure is not statistically significant in determining the profitability of commercial banks in Nepal. Bist et al. (2019) found that leverage and credit to core capital plus deposit ratio are positively correlated to return on assets which indicates that increase in the liquidity ratio will leads to increase in the return on assets.



The above discussion shows that empirical evidences vary greatly across the studies on the effect of capital ratios on the risk, efficiency and 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 analyse the effect of capital ratios on the risk, efficiency and profitability of Nepalese commercial banks. Specifically, it examines the relationship of Tier 1 capital ratio, total assets, capital adequacy ratio, Tier 1 capital to total assets, net loan to total assets and assets growth with return on assets, management efficiency and loan loss provision 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 12 commercial banks on the basis of total assets for the period from 2012/13 to 2020/21, leading to a total of 108 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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                                   | NIC Asia Bank Limited               | 2012/13-2020/21 | 9            |
| 2                                   | Nabil Bank Limited                  | 2012/13-2020/21 | 9            |
| 3                                   | Siddhartha Bank Limited             | 2012/13-2020/21 | 9            |
| 4                                   | Nepal Investment Bank Limited       | 2012/13-2020/21 | 9            |
| 5                                   | Everest Bank Limited                | 2012/13-2020/21 | 9            |
| 6                                   | Prime commercial Bank Limited       | 2012/13-2020/21 | 9            |
| 7                                   | Kumari Bank Limited                 | 2012/13-2020/21 | 9            |
| 8                                   | Mega Bank Nepal Limited             | 2012/13-2020/21 | 9            |
| 9                                   | Himalayan Bank Limited              | 2012/13-2020/21 | 9            |
| 10                                  | Citizens Bank International Limited | 2012/13-2020/21 | 9            |
| 11                                  | Sanima Bank Limited                 | 2012/13-2020/21 | 9            |
| 12                                  | Machhapuchchhre Bank Limited        | 2012/13-2020/21 | 9            |
| <b>Total number of observations</b> |                                     |                 | <b>108</b>   |

Thus, the study is based on the 108 observations.

### The model

The model used in this study assumes that the capital ratio depends upon risk, efficiency and profitability. The dependent variables selected for the study are return on assets, management efficiency and loan loss

provision. Similarly, the selected independent variables are Tier 1 capital ratio, total assets, capital adequacy ratio, Tier 1 capital to total assets and net loan to total assets. Therefore, the models take the following form:

$$\begin{aligned} \text{ROA} &= \beta_0 + \beta_1 \text{CAR}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{T1CR}_{it} + \beta_4 \text{T1TA}_{it} + \beta_5 \text{NLTA}_{it} + \beta_6 \text{AG}_{it} + e_{it} \\ \text{ME} &= \beta_0 + \beta_1 \text{CAR}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{T1CR}_{it} + \beta_4 \text{T1TA}_{it} + \beta_5 \text{NLTA}_{it} + \beta_6 \text{AG}_{it} + e_{it} \\ \text{LLP} &= \beta_0 + \beta_1 \text{CAR}_{it} + \beta_2 \text{TA}_{it} + \beta_3 \text{T1CR}_{it} + \beta_4 \text{T1TA}_{it} + \beta_5 \text{NLTA}_{it} + \beta_6 \text{AG}_{it} + e_{it} \end{aligned}$$

Where,

|      |   |                                                                                                                        |
|------|---|------------------------------------------------------------------------------------------------------------------------|
| ROA  | = | Return on assets as measured by the ratio of net income to total assets, in percentage.                                |
| ME   | = | Management efficiency as measured by the ratio of operating expenses to total assets, in percentage.                   |
| LLP  | = | Loan loss provision, Rs. in million.                                                                                   |
| CAR  | = | Capital adequacy ratio as measured by the ratio of equity to total assets, in percentage.                              |
| TA   | = | Total assets as measured by total asset of the bank, Rs in million.                                                    |
| T1CR | = | Tier 1 capital ratio as measured by the ratio of Tier 1 capital (core capital) to risk weighted assets, in percentage. |
| T1TA | = | Tier 1 to total assets as measured by the ratio of core capital to total assets, in percentage.                        |
| NLTA | = | Net loan to total assets as measured by the ratio of net loan to total assets, in percentage.                          |
| AG   | = | Assets growth as measured by the change in assets to last year assets, in percentage.                                  |

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

## Tier 1 capital ratio

Tier 1 capital ratio measures a bank's core equity capital against its total risk-weighted assets. It includes all the assets the bank holds that are systematically weighted for credit risk. Similarly, Sari and Rahayu (2018) examined the effects of tier-1 capital, risk management, and profitability on the performance of Indonesian commercial banks. The study showed that tier-1 capital has a positive effect on capital on risk management. In addition, Rangkuti (2020) examined that tier-1 capital has a positive effect on profitability with risk management as a mediation variable. Furthermore, De Bandt et al. (2014) analysed the effect of banks' capitalization on return on equity (ROE). The study revealed a positive effect of an increase in capital on banks' ROE. Moreover, Oino (2018) examined the impact of regulatory capital on European banks financial performance. The study revealed a positive association between tier 1 capital and financial performance. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a positive relationship of Tier1 capital ratio with risk, profitability and efficiency.

## Capital adequacy ratio

Capital adequacy ratio is the ratio of a bank's capital in relation to its risk weighted assets and current liabilities. The capital adequacy ratio set standards for banks by looking at a bank's ability to pay liabilities, and respond to credit risks and operational risks. Shabani et al. (2019) investigated the effect of capital adequacy ratio on return on assets of banking sector in Kosovo. The study concluded that capital adequacy has a positive impact on returns on assets. Likewise, Aspal and Nazneen (2014) investigated the determinants of capital adequacy ratio in Indian private sector banks. The result highlighted that capital adequacy ratio



is negatively correlated with proxy variables of lending (loans), asset quality and management efficiency. In addition, Madugu et al. (2020) investigated the differential effects of credit risk and capital adequacy ratio on profitability of the domestic banking sector in Ghana. The study showed that CAR negatively influence the profitability of foreign banks with no apparent impact on local banks. Moreover, Brastama and Yadnya (2020) assessed the effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable. The study showed that CAR variable has a positive effect on stock prices. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a positive relationship of capital adequacy ratio with bank profitability, efficiency and risk.

## **Tier 1 to total assets**

It is a key measure of a bank's financial strength that has been adopted as part of the Basel III Accord on bank regulation. Jacques and Nigro (1997) concluded that there is a negative relationship between changes in capital and risk. Likewise, Chandrasegaran (2020) investigated capital adequacy requirements and profitability. The study found that tier 1 capital to total assets has a negative significant relationship with non-interest income to average assets. In addition, Dionne and Harchaoui (2008) found negative impact of tier 1 ratio on credit risk. Furthermore, Uzun and Webb (2007) showed that credit risk is negatively related to bank capital ratios. Similarly, Bitar et al. (2018) examined the effect of capital ratios on the risk, efficiency and profitability of banks from OECD countries. The study found a positive relationship between capital ratios and bank profits. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a negative relationship of Tier 1 capital to total assets with bank risk.

H<sub>4</sub>: There is a positive relationship of Tier 1 capital to totals assets with efficiency and profitability.

## **Net loan to total assets**

Borio et al. (2017) found a positive relationship between the level of short-term rates and bank profitability. In addition, Tan and Floros (2012) showed that there is a positive relationship between bank profitability, banking sector development, cost efficiency, stock market development and inflation in China. Furthermore, Berrios (2013) assessed the relationship between bank credit risk and profitability and liquidity. The study found a positive relationship between higher debt levels and credit risk. Moreover, Abdullah et al. (2014) showed that operating efficiency has a tendency to demonstrate higher profitability level as measured by ROE and high credit risk and capitalization leads to lower profitability as measured by ROA. The study also showed a positive relationship between loan to deposit ratio and ROA. Furthermore, Ruziqa (2013) analysed the impact of credit and liquidity risk on bank financial performance. The result showed that credit ratio has positive and significant effect on ROA and ROE. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a positive relationship of net loan to total assets with efficiency and profitability.

## **Total assets**

According to Gooding and Wagner (1985), organizational size and organizational productivity are positively related to each other. Likewise, Bestariningrum (2015) concluded that capital structure and firm size have a positive and significant impact on the firm's value. In addition, Hayajneh and Yassine (2011) found a

positive relationship between the size of the firm and growth of sales. Furthermore, Karray and Chichti (2013) examined the bank size and efficiency in developing countries. The study revealed that bank size significantly influences the efficiency. Moreover, Aladwan (2015) assessed the effect of bank size on its profitability for Jordanian listed commercial banks within different size bank categories. The study revealed a positive association between the profitability and bank size. Similarly, Almanidis et al. (2019) investigated the relationship between US bank size and efficiency. The study found a positive relationship between bank size and efficiency. Furthermore, Barr et al. (1994) revealed a significant positive relationship between the size of banks and bank's efficiency. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a positive relationship of total assets with efficiency and profitability.

## Assets growth

The asset growth rate shows how quickly a company has been growing its assets. Kouser et al. (2012) concluded that profitability has strong positive relationship with the growth of the firm. Furthermore, Goddar et al. (2004) examined the dynamics of growth and profitability in banking. The study revealed a positive association between growth and profitability. Moreover, Shehzad et al. (2013) assessed the relationship between size, growth and profitability of commercial banks. The study found that bank growth and bank profitability are positively related. Similarly, Francis (2013) investigated the impact of bank level and macroeconomic factors on the profitability of commercial banks in Sub-Saharan Africa. The study revealed growth in bank deposits has positive influence on bank profitability. Based on it, this study develops the following hypothesis.

H<sub>7</sub>: There is a positive relationship of assets growth with efficiency and profitability.

## 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 2020/21.

**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 2012/13 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), ME (Management efficiency as measured by the ratio of operating expenses to total assets, in percentage) and LLP (Loan loss provision, Rs. in million). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of equity to total assets, in percentage), T1CR (Tier 1 capital ratio as measured by the ratio of Tier 1 capital (core capital) to risk weighted assets, in percentage), TA (Total assets as measured by total asset of the bank, Rs in million), T1TA (Tier 1 to total assets as measured by the ratio of core capital to total assets, in percentage), NLTA (Net loan to total assets as measured by the ratio of net loan to total assets, in percentage) and AG (Assets growth as measured by the change in assets to last year assets, in percentage).

| Variables | Minimum | Maximum | Mean   | Std. Deviation |
|-----------|---------|---------|--------|----------------|
| ROA       | 0.49    | 3.25    | 1.66   | 0.47           |
| ME        | 0.46    | 8.09    | 2.55   | 1.92           |
| LLP       | 1.66    | 2669.06 | 713.76 | 561.31         |

|             |          |           |           |          |
|-------------|----------|-----------|-----------|----------|
| <b>CAR</b>  | 10.63    | 18.06     | 13.09     | 1.50     |
| <b>TA</b>   | 17408.00 | 346147.52 | 106422.59 | 65129.19 |
| <b>T1CR</b> | 0.11     | 17.28     | 11.22     | 2.17     |
| <b>T1TA</b> | 5.23     | 16.20     | 9.72      | 2.10     |
| <b>NLTA</b> | 0.54     | 0.91      | 0.70      | 0.07     |
| <b>AG</b>   | -0.04    | 81.92     | 24.81     | 15.46    |

Source: SPSS output

## Correlation analysis

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

**Table 3:** Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 12 Nepalese commercial banks for the study period from 2012/13 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), ME (Management efficiency as measured by the ratio of operating expenses to total assets, in percentage) and LLP (Loan loss provision, Rs. in million). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of equity to total assets, in percentage), T1CR (Tier 1 capital ratio as measured by the ratio of Tier 1 capital (core capital) to risk weighted assets, in percentage), TA (Total assets as measured by total asset of the bank, Rs in million), T1TA (Tier 1 to total assets as measured by the ratio of core capital to total assets, in percentage), NLTA (Net loan to total assets as measured by the ratio of net loan to total assets, in percentage) and AG (Assets growth as measured by the change in assets to last year assets, in percentage).

| Variables   | ROA     | ME      | LLP     | CAR     | TA      | T1CR    | T1TA    | NLTA  | AG |
|-------------|---------|---------|---------|---------|---------|---------|---------|-------|----|
| <b>ROA</b>  | 1       |         |         |         |         |         |         |       |    |
| <b>ME</b>   | 0.062   | 1       |         |         |         |         |         |       |    |
| <b>LLP</b>  | 0.082   | 0.164   | 1       |         |         |         |         |       |    |
| <b>CAR</b>  | -0.105  | -0.076  | 0.126   | 1       |         |         |         |       |    |
| <b>TA</b>   | 0.016   | 0.215*  | 0.650** | 0.071   | 1       |         |         |       |    |
| <b>T1CR</b> | 0.073   | -0.234* | -0.044  | 0.699** | -0.227* | 1       |         |       |    |
| <b>T1TA</b> | 0.121   | -0.178  | 0.101   | 0.599** | -0.137  | 0.680** | 1       |       |    |
| <b>NLTA</b> | -0.198* | -0.051  | -0.120  | 0.461** | -0.084  | 0.335** | 0.462** | 1     |    |
| <b>AG</b>   | 0.221*  | 0.115   | -0.179  | 0.195*  | -0.072  | 0.104   | 0.009   | 0.100 | 1  |

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

Table 3 reveals that there is a negative relationship between capital adequacy ratio and return on assets. It indicates that increase in capital adequacy ratio leads to decrease in return on assets. Similarly, there is a positive relationship between total assets and return on assets. It means that larger the bank size, higher would be the return on assets. In addition, Tier 1 capital ratio has a positive relationship with return on assets. It means that increase in Tier 1 capital ratio leads to increase in return on assets. Furthermore, there is a positive relationship between Tier 1 to total assets and return on assets. It indicates that increase in Tier 1 to total assets leads to increase in return on assets. Similarly, there is a negative relationship between net loan to total assets ratio and return on assets. It indicates that increase in net loan to total assets ratio leads to decrease in return on assets. In addition, there is positive relationship between assets growth ratio and return on assets. It indicates that increase in assets growth leads to increase in return on assets.

Similarly, the result shows that there is a negative relationship between capital adequacy ratio and management efficiency. It indicates that increase in capital adequacy ratio leads to decrease in management efficiency. Similarly, there is a positive relationship between total assets and management efficiency. It means that larger the total assets, higher would be the management efficiency. In addition, Tier 1 capital ratio has a negative relationship with management efficiency. It means that increase in Tier 1 capital ratio leads to decrease in management efficiency. Furthermore, there is a negative relationship between Tier 1 to total assets and management efficiency. It indicates that increase in Tier 1 to total assets leads to decrease in management efficiency. Similarly, there is a negative relationship between net loan to total assets and management efficiency. It indicates that increase in net loan to total assets ratio leads to decrease in management efficiency. In addition, there is a positive relationship between assets growth and management efficiency. It indicates that increase in assets growth leads to increase in management efficiency.

Similarly, the result shows that there is a positive relationship between capital adequacy ratio and loan loss provision. It indicates that increase in capital adequacy ratio leads to increase in loan loss provision. Similarly, there is a positive relationship between total assets and loan loss provision. It means that larger the total assets, higher would be the loan loss provision. In addition, Tier 1 capital ratio has a negative relationship with loan loss provision. It means that increase in Tier 1 capital ratio leads to decrease in loan loss provision. Furthermore, there is a positive relationship between Tier 1 to total assets and loan loss provision. It indicates that increase in Tier 1 to total assets leads to increase in loan loss provision. Similarly, there is a negative relationship between net loan to total assets and loan loss provision. It indicates that increase in net loan to total assets ratio leads to decrease in loan loss provision. In addition, there is a negative relationship between assets growth and loan loss provision. It indicates that increase in assets growth leads to decrease in loan loss provision.

## **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 assets, Tier 1 capital ratio, Tier 1 to total assets ratio, net loan to total assets ratio and assets growth on return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of capital adequacy ratio, total assets, tier 1 capital ratio, tier 1 to total assets ratio, net loan to total assets ratio and assets growth on return on assets

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2012/12-2020/21 by using the linear regression model and the model is  $ROA = \beta_0 + \beta_1 CAR_t + \beta_2 TA_t + \beta_3 T_1CR_t + \beta_4 T_1TA_t + \beta_5 NLTA_t + \beta_6 AG_t + e_{it}$ , 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 equity to total assets, in percentage),  $T_1CR$  (Tier 1 capital ratio as measured by the ratio of Tier 1 capital (core capital) to risk weighted assets, in percentage),  $TA$  (Total assets as measured by total asset of the bank, Rs in million),  $T_1TA$  (Tier 1 to total assets as measured by the ratio of core capital to total assets, in percentage),  $NLTA$  (Net loan to total assets as measured by the ratio of net loan to total assets, in percentage) and  $AG$  (Assets growth as measured by the change in assets to last year assets, in percentage).

| Model | Intercept           | Regression coefficients of |                  |                    |                   |                    |                   | Adj. R_bar <sup>2</sup> | SEE    | F-value |
|-------|---------------------|----------------------------|------------------|--------------------|-------------------|--------------------|-------------------|-------------------------|--------|---------|
|       |                     | CAR                        | TA               | T1CR               | T1TA              | NLTA               | AG                |                         |        |         |
| 1     | 2.092<br>(5.193)**  | -0.033<br>(1.082)          |                  |                    |                   |                    |                   | 0.002                   | 0.474  | 1.171   |
| 2     | 0.798<br>(0.313)    |                            | 0.076<br>(0.276) |                    |                   |                    |                   | 0.002                   | 0.473  | 0.028   |
| 3     | 1.479<br>(6.110)**  |                            |                  | 0.016<br>(0.757)   |                   |                    |                   | 0.004                   | 0.475  | 0.754   |
| 4     | 1.394<br>(6.432)**  |                            |                  |                    | 0.027<br>(1.251)  |                    |                   | 0.005                   | 0.473  | 1.566   |
| 5     | 2.598<br>(5.720)**  |                            |                  |                    |                   | -1.345<br>(2.077)* |                   | 0.030                   | 0.467  | 4.313   |
| 6     | 1.827<br>(21.558)** |                            |                  |                    |                   |                    | 0.007<br>(2.336)* | 0.040                   | 0.464  | 5.456   |
| 7     | 1.225<br>(1.397)    | -0.034<br>(1.100)          | 0.077<br>(1.113) |                    |                   |                    |                   | 0.004                   | 0.473  | 1.206   |
| 8     | 0.660<br>(0.754)    | -0.118<br>(2.753)**        | 0.142<br>(1.993) | 0.083<br>(2.728)** |                   |                    |                   | 0.061                   | 0.459  | 3.334   |
| 9     | 0.714<br>(0.820)    | -0.133<br>(3.051)**        | 0.138<br>(1.953) | 0.059<br>(1.766)   | 0.046<br>(1.571)  |                    |                   | 0.074                   | 0.456  | 3.152   |
| 10    | 1.698<br>(1.743)    | -0.103<br>(2.266)*         | 0.109<br>(1.540) | 0.047<br>(1.405)   | 0.065<br>(2.150)* | -1.579<br>(0.037)  |                   | 0.105                   | 0.448  | 3.505   |
| 11    | 1.828<br>(1.886)    | -0.087<br>(1.901)          | 0.095<br>(1.339) | 0.046<br>(1.385)   | 0.059<br>(1.937)* | -1.545<br>(2.090)* | 0.005<br>(1.649)  | 0.120                   | 0.4445 | 3.423   |

**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 asset is the dependent variable.

Table 4 shows that the beta coefficients of capital adequacy ratio are negative with return on assets. It indicates that capital adequacy ratio has a negative impact on return on assets. This finding is similar to the findings of Madugu et al. (2020). Similarly, the beta coefficients of total assets are positive with return on assets. It indicates that total assets have a positive impact on return on assets. This finding is consistent with the findings of Aladwan (2015). Likewise, the beta coefficients of Tier 1 capital ratio are positive with return on assets. It indicates that Tier 1 capital ratio has a positive impact on return on assets. This finding is similar to the findings of Sari and Rahayu (2018). Similarly, the beta coefficients of Tier 1 capital to total

assets ratio are positive with return on assets. It indicates that Tier 1 capital to total assets ratio has positive impact on return on assets. This finding is consistent with the findings of Tan (2016). Furthermore, the beta coefficients of assets growth are positive with return on assets. It indicates that assets growth has a positive impact on return on assets. This finding is consistent with the findings of Shehzad et al. (2013).

Table 5 shows the estimated regression results of capital adequacy ratio, total assets, Tier 1 capital ratio, Tier 1 to total assets ratio, net loan to total assets ratio and assets growth on management efficiency of Nepalese commercial banks.

**Table 5:** Estimated regression results of capital adequacy ratio, total assets, tier 1 capital ratio, tier 1 to total assets ratio, net loan to total assets ratio and assets growth on management efficiency

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2012/12-2020/21 by using the linear regression model and the model is  $ME = \beta_0 + \beta_1 CAR_{it} + \beta_2 TA_{it} + \beta_3 T1CR_{it} + \beta_4 T1TA_{it} + \beta_5 NLTA_{it} + \beta_6 AG_{it} + e_{it}$ , where, the dependent variable is ME (Management efficiency as measured by the ratio of operating expenses to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of equity to total assets, in percentage), T1CR (Tier 1 capital ratio as measured by the ratio of Tier 1 capital (core capital) to risk weighted assets, in percentage), TA (Total assets as measured by total asset of the bank, Rs in million), T1TA (Tier 1 to total assets as measured by the ratio of core capital to total assets, in percentage), NLTA (Net loan to total assets as measured by the ratio of net loan to total assets, in percentage) and AG (Assets growth as measured by the change in assets to last year assets, in percentage).

| Model | Intercept          | Regression coefficients of |                   |                    |                   |                   |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|-------------------|--------------------|-------------------|-------------------|------------------|-------------------------|-------|---------|
|       |                    | CAR                        | TA                | T1CR               | T1TA              | NLTA              | AG               |                         |       |         |
| 1     | 3.820<br>(2.336)*  | -0.097<br>(0.784)          |                   |                    |                   |                   |                  | 0.004                   | 1.922 | 0.614   |
| 2     | -4.699<br>(1.503)  |                            | 0.637<br>(2.321)* |                    |                   |                   |                  | 0.039                   | 1.880 | 5.388   |
| 3     | 4.875<br>(5.102)** |                            |                   | -0.207<br>(2.418)* |                   |                   |                  | 0.046                   | 1.874 | 6.155   |
| 4     | 4.134<br>(4.753)** |                            |                   |                    | -0.163<br>(1.867) |                   |                  | 0.023                   | 1.896 | 3.486   |
| 5     | 3.529<br>(1.884)*  |                            |                   |                    |                   | -1.407<br>(0.527) |                  | 0.007                   | 1.925 | 0.277   |
| 6     | 2.900<br>(8.295)** |                            |                   |                    |                   |                   | 0.014<br>(1.189) | 0.004                   | 1.915 | 1.413   |
| 7     | -3.409<br>(0.976)  | -0.101<br>(0.834)          | 0.640<br>(2.330)* |                    |                   |                   |                  | 0.037                   | 1.883 | 3.034   |
| 8     | -1.705<br>(-0.481) | -0.153<br>(0.884)          | 0.444<br>(1.547)  | -0.250<br>(2.037)* |                   |                   |                  | 0.065                   | 1.855 | 3.466   |
| 9     | -1.797<br>(0.506)  | -0.179<br>(1.005)          | 0.451<br>(1.564)  | -0.210<br>(1.529)  | -0.079<br>(0.657) |                   |                  | 0.060                   | 1.860 | 2.693   |
| 10    | -2.454<br>(0.604)  | -0.159<br>(0.840)          | 0.470<br>(1.594)  | -0.202<br>(1.441)  | -0.092<br>(0.726) | -1.056<br>(0.340) |                  | 0.051                   | 1.868 | 2.159   |
| 11    | -2.084<br>(0.512)  | -0.202<br>(1.051)          | 0.430<br>(1.446)  | -0.205<br>(1.464)  | -0.110<br>(0.864) | -1.151<br>(0.371) | 0.014<br>(1.115) | 0.054                   | 1.866 | 2.011   |

**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. Management efficiency is the dependent variable.

Table 5 shows that the beta coefficients of capital adequacy ratio are negative with management efficiency. It indicates that capital adequacy ratio has a negative impact on management efficiency. This finding is similar to the findings of Aspal and Nazneen (2014). Similarly, the beta coefficients of total assets are positive with management efficiency. It indicates that total assets have a positive impact on return on management efficiency. This finding is consistent with the findings of Karray and Chichti (2013). Likewise, the beta coefficients of Tier 1 capital ratio are negative with management efficiency. It indicates that Tier 1 capital ratio has a negative impact on management efficiency. This finding is similar to the findings of De Bandt et al. (2014). Similarly, the beta coefficients of Tier 1 capital to total assets ratio negative with management efficiency. It indicates that Tier 1 capital to total assets ratio has negative impact on return on assets. This finding is consistent with the findings of Dionne and Harchaoui (2008).

Table 6 shows the estimated regression results of capital adequacy ratio, total assets, Tier 1 capital ratio, Tier 1 to total assets ratio, net loan to total assets ratio and assets growth on loan loss provision of Nepalese commercial banks.

**Table 6:** Estimated regression results of capital adequacy ratio, total assets, tier 1 capital ratio, tier 1 to total assets ratio, net loan to total assets ratio and assets growth on loan loss provision

The results are based on panel data of 12 commercial banks with 108 observations for the period of 2012/12-2020/21 by using the linear regression model and the model is  $LLP = \beta_0 + \beta_1 CAR_{it} + \beta_2 TA_{it} + \beta_3 T1CR_{it} + \beta_4 T1TA_{it} + \beta_5 NLTA_{it} + \beta_6 AG_{it} + \epsilon_{it}$ , where, the dependent variable is LLP (Loan loss provision, Rs. in million). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of equity to total assets, in percentage), T1CR (Tier 1 capital ratio as measured by the ratio of Tier 1 capital (core capital) to risk weighted assets, in percentage), TA (Total assets as measured by total asset of the bank, Rs in million), T1TA (Tier 1 to total assets as measured by the ratio of core capital to total assets, in percentage), NLTA (Net loan to total assets as measured by the ratio of net loan to total assets, in percentage) and AG (Assets growth as measured by the change in assets to last year assets, in percentage).

| Model | Intercept             | Regression coefficients of |                    |                   |                     |                     |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|-----------------------|----------------------------|--------------------|-------------------|---------------------|---------------------|--------------------|-------------------------|-------|---------|
|       |                       | CAR                        | TA                 | T1CR              | T1TA                | NLTA                | AG                 |                         |       |         |
| 1     | 20.052<br>(24.003)**  | 0.001<br>(0.006)           |                    |                   |                     |                     |                    | 0.009                   | 0.982 | 0.001   |
| 2     | 12.302<br>(8.496)**   |                            | 0.681<br>(5.357)** |                   |                     |                     |                    | 0.206                   | 0.870 | 28.702  |
| 3     | 20.213<br>(40.407)**  |                            |                    | -0.015<br>(0.340) |                     |                     |                    | 0.008                   | 0.981 | 0.115   |
| 4     | 19.572<br>(43.715)**  |                            |                    |                   | 0.049<br>(1.083)    |                     |                    | 0.002                   | 0.976 | 1.172   |
| 5     | 22.239<br>(23.889)**  |                            |                    |                   |                     | -3.143<br>(2.367)*  |                    | 0.041                   | 0.956 | 5.605   |
| 6     | 20.420<br>(117.299)** |                            |                    |                   |                     |                     | -0.015<br>(2.523)* | 0.048                   | 0.953 | 6.365   |
| 7     | 12.363<br>(7.619)**   | 0.005<br>(0.085)           | 0.681<br>(5.333)** |                   |                     |                     |                    | 0.198                   | 0.870 | 14.220  |
| 8     | 11.836<br>(7.115)**   | 0.084<br>(1.027)           | 0.742<br>(5.493)** | -0.077<br>(1.341) |                     |                     |                    | 0.204                   | 0.871 | 10.152  |
| 9     | 11.953<br>(7.258)**   | 0.117<br>(1.414)           | 0.733<br>(5.489)** | -0.026<br>(0.412) | 0.101<br>(91.813)** |                     |                    | 0.221                   | 0.862 | 8.602   |
| 10    | 14.325<br>(7.884)**   | 0.043<br>(0.510)           | 0.664<br>(5.025)** | -0.003<br>(0.052) | 0.147<br>(2.592)**  | -3.807<br>(2.739)** |                    | 0.268                   | 0.836 | 8.816   |
| 11    | 14.661<br>(8.123)**   | 0.009<br>(0.109)           | 0.632<br>(4.861)** | -0.006<br>(0.090) | 0.133<br>(2.354)*   | -3.734<br>(2.721)** | -0.010<br>(1.945)  | 0.287                   | 0.825 | 8.178   |



**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. Loan loss provision is the dependent variable.

Table 6 shows that the beta coefficients of capital adequacy ratio are positive with loan loss provision. It indicates that capital adequacy ratio has a positive impact on loan loss provision. This finding is similar to the findings of Brastama and Yadnya (2020). Similarly, the beta coefficients of Tier 1 capital ratio are negative with loan loss provision. It indicates that Tier 1 capital ratio has a negative impact on loan loss provision. This finding is similar to the findings of Rangkuti (2020). Similarly, the beta coefficients of Tier 1 capital to total assets ratio are positive with loan loss provision. It indicates that Tier 1 capital to total assets ratio has positive impact on return on assets. This finding is consistent with the findings of Bitar et al. (2018). In addition, the beta coefficients of net loan to total assets are negative with loan loss provision. It indicates that net loan to total assets has a negative impact on loan loss provision. This finding is consistent with the findings of Ruziqa (2013). Furthermore, the beta coefficient of assets growth is negative with loan loss provision. It indicates that assets growth has a negative impact on loan loss provision. This finding is consistent with the findings of Francis (2013).

## 4. Summary and conclusion

Banks' capital is the key driver of a resilient banking system that is capable of absorbing shocks. Capital requirements for banks have traditionally been regarded as one of the main tools to guarantee the financial stability of the banking sector. Capital requirements are regulations that limit the volume of leverage that banks can take on, but also the volume of quality capital banks must attain.

This study attempts to analyse the effect of capital ratios on risk, efficiency and profitability of Nepalese commercial banks. The study is based on secondary data of 12 commercial banks with 108 observations for the period from 2012/13 to 2020/21.

The study concluded that total assets, Tier 1 capital ratio, assets growth and Tier 1 capital to total assets rate have positive impact on return on assets. However, capital adequacy ratio and net loan to total assets have negative impact on return on assets. Likewise, the study also showed that total assets have positive impact on management efficiency. However, capital adequacy ratio, Tier 1 capital ratio, Tier 1 to total assets and net loan to total assets have negative impact on management efficiency. Likewise, capital adequacy ratio, total assets, tier 1 capital to total assets has positive impact on loan loss provision. However, Tier 1 capital ratio, net loan to total assets and assets growth has negative impact on loan loss provision. Likewise, the study also concluded that assets growth followed by net loan to total assets is the most influencing factor that explains the change in return on assets in context of Nepalese commercial banks. Similarly, the study also concluded that Tier 1 capital ratio followed by total assets is the most influencing factor that explains the change in management efficiency in context of Nepalese commercial banks. Similarly, assets growth followed by total assets is the most influencing factor that explains the change in loan loss provision in context of Nepalese commercial banks.

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## Abstract

*This study examines the impact of macro-economic factors on the level of deposits of Nepalese commercial banks. Total deposits and deposit growth rate are selected as the dependent variables. Similarly, GDP growth rate, inflation rate, broad money, exchange rate, interest rate and remittance are selected as the independent variables. This study is based on secondary data of 20 commercial banks with 160 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic factors on the level of deposits in the context of Nepalese commercial banks.*

*The study showed that inflation rate has a negative impact on total deposit. It means that increase in inflation rate leads to decrease in total deposit. However, money supply has a positive impact on total deposit and deposit growth rate. It shows that increase in money supply leads to increase in total deposit and deposit growth rate. Furthermore, exchange rate has a positive impact on total deposit. It indicates that increase in exchange rate leads to increase in total deposit. In addition, interest rate has a positive impact on total deposit. It indicates that increase in interest rate leads to decrease in total deposit. Further, the study also showed that there is a positive impact of remittance on total deposit. It means that increase in remittance leads to increase in total deposit in Nepalese commercial banks.*

**Key words:** Total deposit, deposit growth rate, GDP growth rate, inflation rate, exchange rate, money supply, interest rate and remittance.



# 1. Introduction

One of the common goals of any economy is to achieve sustainable economic growth. A sound, stable and well-developed financial system plays a crucial role for economic growth. It facilitates the financial intermediation process of flow of funds between the surplus fund form savers and deficit fund to borrowers. Then, it ensures the financial resources to be allocated efficiently for promoting economic growth and development (Salami and Oluseyi, 2013). Banks immensely contribute to economic growth through their intermediating function of linking surplus and deficit fund sectors (Saunders and Cornett, 2011). The growing number of banks over the years has resulted in banking sector efficiency and competition. This has led to growth in banks' profits. One of the key activities of banks contributing to their efficiency is deposit mobilization. In emerging markets, deposits are core to bank operations (Unvan and Yakubu, 2020). Banks play financial intermediary role of mobilizing fund from savers and making them loan to investors. Basically, the main source of profits of banks can be received from the difference in the interest rates paid to depositors and charged to borrowers (Farouq et al., 2020). Therefore, deposits are main source of working funds of economy as well as main source of funds for the banks. According to Rajamohan and Dhanabalan (2012), deposits are the life blood of a banking institution as they constitute the chief source of funds to undertake lending operations.

The interest rate plays a key role in banking systems because it determines the benefits of the difference between the interest rate on loans and the interest rate on deposits. However, exposure to risk is often present because banks provide long-term loans financed by short-term deposits, and this involves the interest rate risk. One of the most important channels of monetary policy transmission in an economy is interest rates. Macroeconomic factors and the financial sector structure in the economy of a country have a significant impact on determining the interest rate elevation (Morina and Osmani, 2019). The level of deposits is very important to the banking system as this affects bank decisions to maintain a stock to deal with unpredicted future situations. However, the level of deposits of a bank can be viewed as a positive evaluation as they affect the bank's liquidity growth. At the same time, they serve as sources of funding for the bank and if the bank performance will be negative, then depositors may influence its retirement by withdrawing deposits. Meanwhile, there are many unpredictable and impossible factors banks cannot manage. These factors are macroeconomic factors whose value varies depending on the country's economic situation. They will affect the behavior of the contributors, affecting bank decisions (Yeyati et al., 2010). Al Shaher et al. (2011) examined the major factors that affect the commercial banks' performance in the Middle East region based on factor analysis technique. The study found that the growth per capita income is the most significant factor in affecting the bank deposits. Similarly, Anthony (2012) examined the impact of bank savings and bank credits on Nigeria's economic growth from 1970 to 2006. The study found that the value of GDP per capita has a positive and statistically significant relationship with the size of saving. Moreover, Boadi et al. (2015) investigated the determinants of bank deposit in Ghana using quarterly data over the periods of 1991 to 2012. The study found that the economic growth based on Gross Domestic Product (GDP) has a strong effect on bank deposits. It indicates that once the economy grows there is a greater likelihood of an increase in bank deposits.

Yakubu and Abokor (2020) examined the key factors determining bank deposit growth in Turkey. The results revealed that bank stability, banking sector efficiency, broad money supply, economic growth, and inflation are significant determinants of deposit growth in the long run. The findings further showed that in the short run, only branch expansion and broad money supply are relevant for bank deposit mobilization. Larbi-Siaw and Lawer (2015) investigated the drivers of bank deposits in the context of

Ghana. The study revealed that there is an inverse relationship between inflation rate and money supply in the short run. However, the study showed a direct impact of monetary policy on deposit in the short run. The study also evidenced that in the long run, money supply directly explains deposit level, while the effects of interest rate and inflation are negative. Moreover, Unvan and Yakubu (2020) applied the random effects technique on bank-level data to examine the drivers of bank deposits in Ghana for the period 2008–2017. Controlling for macroeconomic indicators, the study found that bank deposit mobilization is significantly driven by bank size, banks' profit level and liquidity. For macroeconomic factors, the results found a significant negative effect of inflation on deposits. In addition, Tatliyer (2017) used the OLS and vector error-correction model to investigate the factors affecting private savings for the period 1988–2010. The study showed that private savings level is increased by lower social security level and inflation rate.

Acaravci and Calim (2013) examined the determinants of Turkish banking sector's profitability. The results of random effect model indicated the positive and statistically significant impact of real GDP on the level of deposits. Moyo and Roux (2018) analyzed the impact of interest rate reforms on economic growth through savings and investments in SADC countries for the period 1990- 2015. The study found that income captured by GDP per capita growth has a positive impact on savings. Furthermore, Azu-Nwangolo and Ogechi (2018) examined the effect of financial deepening on customer deposit of Nigerian commercial banks using time series data for the period of 1981-2017. The study found that narrow money supply has negative but insignificant effect on total customer deposit of commercial banks while private sector credit, board money supply and money outside the bank have positive effect on customer deposits of commercial banks. The study also concluded that there is a significant impact of financial deepening on total customer deposit and the need to deepen the policies to enhance the performance of the Nigeria financial market. Likewise, Mashamba et al. (2014) examined the relationship between banks' deposit interest rate and deposit mobilization in Zimbabwean commercial banks for the period of 1980 to 2006. The finding revealed the strong relationship between commercial bank deposits and level of economic activity in Zimbabwe. In non-Islamic banks, inflation has no impact on the level of deposits. However, the interest rate and broad money have a significant positive impact on deposits (Mushtaq and Siddiqui, 2016).

According to Turhani and Hoda (2016), GDP has an insignificant impact on deposits in Albania. In contrast, inflation and interest rates on deposits have a negative relationship. Demirguc-Kunt and Detragiache (1998) examined determinants of banking crises in developed and developing countries. The study showed that low GDP has a significant impact on the growth of interest rates of loans and deposits. When the deposit interest rate decreases then it leads to an increase in deposits. Haron and Azmi (2008) demonstrated that Islamic banking deposits fluctuation, is not only affected by changes in profit margin in Islamic banks but also affected by changes in interest rate on conventional deposits and shocks in monetary policy. Abduh et al. (2011) analyzed the dynamic effects of interest and profit rate changes, production level, inflation and financial crisis towards the fluctuation of total deposits in Malaysian Islamic banks. The results showed that changes in interest and profit rate as well as production growth has no significant effects. Meanwhile, inflation has negative effect on total deposits of Islamic banks which reflects the changes on depositors' consumption pattern during the recession. The study also concluded that financial crisis is positively related to total deposits in Islamic banks.

Loayza and Shankar (2000) used co-integration approach to determine the relationship among savings and other factors like real interest rate, per capita income, the dependency ratio, financial development, the government saving rate and the share of agriculture in gross domestic product (GDP). The results revealed that real interest rate, per capita income and the share of agriculture in GDP have a positive

relationship with savings. However, there is an inverse relationship of financial development, inflation and the dependency ratio with deposits. Athukorala and Sen (2003) ascertained factors such as rate of growth, real interest rate on bank deposits, spread of banking facilities and inflation have significant positive relationship with savings but inverse relationship with changes in the external trade. In addition, Athukorala and Tsai (2003) assessed the impact of population dynamics, growth of disposable income, social security contribution, and credit availability and financial reforms on savings in Taiwan. The result showed that Income growth, aging of the population, changes in social security contributions and the availability of credit were significant to savings performance. However, interest rate has a significant positive impact and inflation has a negative impact on deposits. Omar et al. (2009) applied co-integration techniques to determine the savings behaviour of households. The study found that fertility changes, old dependency ratio, real interest rate, liquidity and public finance have significant effect on saving function. The study also showed that macro-economic variables like interest rate, inflation rate and GDP has significant impact on savings behaviour.

In the context of Nepal, Gaire (2012) examined real interest rate and saving behavior in Nepal. The study found that there is long- run positive relationship between real interest rate and growth of bank deposit. Likewise, Shrestha (2008) analyzed private savings behavior in Nepal. The study found that changes in income, government savings and interest rates are significant in explaining short run dynamics of private savings (deposit). Similarly, Neupane (2020) examined the determinants of commercial bank profitability in Nepal. The study revealed that industry specific factors such as concentration and banking sector development have high degree of impact on return on assets whereas macroeconomic variables such as GDP growth, inflation rate and exchange rate have quite a weak degree but significant impact on profitability of Nepalese commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of macro-economic factors on the level of deposits of 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 main purpose of the study is to analyse the impact of macro-economic factors on the level of deposits of Nepalese commercial banks. Specifically, it examines the relationship of GDP growth rate, inflation rate, broad money, exchange rate, interest rate and remittances with total deposits and deposit growth rate in the context of Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 20 Nepalese commercial banks from 2013/14 to 2020/21, leading to a total of 160 observations. The main sources of data include publications and websites of 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 |
|-------------------------------------|---------------------------------------|-----------------|--------------|
| <b>A. Private Banks</b>             |                                       |                 |              |
| 1                                   | NIC Asia Bank Limited                 | 2013/14-2020/21 | 8            |
| 2                                   | Global IME Bank Limited               | 2013/14-2020/21 | 8            |
| 3                                   | Siddhartha Bank Limited               | 2013/14-2020/21 | 8            |
| 4                                   | Nepal Investment Bank Limited         | 2013/14-2020/21 | 8            |
| 5                                   | Himalayan Bank Limited                | 2013/14-2020/21 | 8            |
| 6                                   | Prabhu Bank Limited                   | 2013/14-2020/21 | 8            |
| 7                                   | Kumari Bank Limited                   | 2013/14-2020/21 | 8            |
| 8                                   | Prime Commercial Bank Limited         | 2013/14-2020/21 | 8            |
| 9                                   | Sanima Bank Limited                   | 2013/14-2020/21 | 8            |
| 10                                  | Mega Bank Nepal Limited               | 2013/14-2020/21 | 8            |
| 11                                  | Citizens Bank International Limited   | 2013/14-2020/21 | 8            |
| 12                                  | Machhapuchchhre Bank Limited          | 2013/14-2020/21 | 8            |
| 13                                  | Sunrise Bank Limited                  | 2013/14-2020/21 | 8            |
| 14                                  | Laxmi Bank Limited                    | 2013/14-2020/21 | 8            |
| <b>B. Public Banks</b>              |                                       |                 |              |
| 15                                  | Rastriya Banijya Bank Limited         | 2013/14-2020/21 | 8            |
| 16                                  | Nepal Bank Limited                    | 2013/14-2020/21 | 8            |
| <b>C. Joint Venture Banks</b>       |                                       |                 |              |
| 17                                  | Nabil Bank Limited                    | 2013/14-2020/21 | 8            |
| 18                                  | NMB Bank Limited                      | 2013/14-2020/21 | 8            |
| 19                                  | Everest Bank Limited                  | 2013/14-2020/21 | 8            |
| 20                                  | Standard Chartered Bank Nepal Limited | 2013/14-2020/21 | 8            |
| <b>Total number of observations</b> |                                       |                 | <b>160</b>   |

Thus, the study is based on the 160 observations.

## The models

The model used in this study assumes that level of deposits depends on macro-economic factors. The dependent variables selected for the study are total deposit and deposit growth. Similarly, the selected independent variables in this study are gross domestic product, exchange rate, broad money, inflation, interest rate and remittance. The following model equations are designed to test the hypothesis.

$$\text{Deposit} = f(\text{GDP, XR, BM, INF, IR, RE})$$

More specifically, the given model has been segmented into following models:

$$\text{TD} = \alpha + \beta_1 \text{GDP} + \beta_2 \text{XR} + \beta_3 \text{BM} + \beta_4 \text{INF} + \beta_5 \text{IR} + \beta_6 \text{RE} + e$$

$$\text{DGR} = \alpha + \beta_1 \text{GDP} + \beta_2 \text{XR} + \beta_3 \text{BM} + \beta_4 \text{INF} + \beta_5 \text{IR} + \beta_6 \text{RE} + e$$

Where,

TD = Total deposits, Rs in billion.

DGR = Deposit growth rate, in percentage.

RE = Remittance inflow, Rs in billion.

|     |                                                                                                |
|-----|------------------------------------------------------------------------------------------------|
| BM  | = Money supply as measured by the broad money to GDP, in percentage.                           |
| GDP | = Gross domestic product growth rate, in percentage.                                           |
| INF | = Inflation rate as measured by the change in consumer price index, in percentage.             |
| XR  | = Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD. |
| IR  | = Interest rate as measured by the lending cost of the bank, in percentage.                    |

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

## GDP growth rate

Mashamba et al. (2014) assessed the relationship between interest rate and bank deposit in Zimbabwe for the period 1980–2006. The study found that deposit interest rate and the level of economic activity (GDP) have a significant positive effect on bank deposits. Likewise, Menza (2019) analyzed long-run and short-run dynamic effects of deposit rate, inflation rate and GDP on bank deposit using Vector Error Correction Model Approach. The study found a significant positive impact on bank deposit. Kumar and Chauhan (2015) revealed a positive effect of GDP on commercial deposits. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a positive relationship between GDP growth rate and level of deposit.

## Inflation

Mashamba et al. (2014) assessed the relationship between interest rate and bank deposit in Zimbabwe for the period 1980–2006. The study showed that inflation rate and interest rates margin have negative effect on deposit mobilization. Abduh et al. (2011) investigated the impact of financial crisis on bank deposits. Using data spanning 2000–2010, and applying the vector error correction model, the findings showed that the interest rate and growth in production level do not significantly drive deposits. However, the study found a negative effect of inflation on deposits. In addition, Haron and Azmi (2008) found that inflation has a negative impact on bank deposit. Similarly, Aziz et al. (2014) examined the factors that determine Islamic Bank's deposits in Qatar. The study indicated that inflation has a negative and significant impact on bank deposit. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a negative relationship between inflation and level of deposit.

## Interest rate

Kasri and Kassim (2009) empirically investigated the factors motivating savings using data obtained from Islamic banks operating in Indonesia for the period 2000–2007. The study revealed that the conventional interest rate is significant in explaining savings behaviour. The study found a positive relationship between interest rate and bank deposit growth. Chinyere (2015) examined the impact of interest rate on savings on the Nigeria's economy. The study indicated that interest rate has a positive relationship with bank deposits. Mashamba et al. (2014) analyzed the relationship between banks' deposit interest rate and deposit mobilisation of Zimbabwean Commercial Banks from 1980 to 2006. The study found a positive relationship between deposit rates and banks' deposits for the period under study and all the other explanatory variables were statistically significant. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a positive relationship between interest rate and level of deposit.

## Broad money

Yakubu and Abokor (2020) revealed that bank stability, banking sector efficiency, broad money supply, economic growth, and inflation are significant determinants of deposit growth in the long run. The findings further showed that in the short run, branch expansion and broad money supply have significant positive impact on bank deposit mobilization. Similarly, Ericsson et al. (1998) revealed a positive relationship between broad money supply and bank deposits in the United Kingdom. Furthermore, Islam et al. (2019) assessed the determinants of deposit mobilization of private commercial banks in Bangladesh. The study found that GDP growth rate and money supply have positive association with the deposit growth and deposit mobilization. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a positive relationship between broad money and level of deposit.

## Exchange rate

Rafiee and Neghabi (2013) examined different factors influencing growth of banking deposits. The study found that exchange rate has a negative and significant impact on bank deposit. Similarly, Ibekwe (2021) analyzed the relationship between exchange rate and performance of deposit money banks in Nigeria. The study found a negative effect of exchange rate on the performance of deposit money banks in Nigeria. Furthermore, Raymond (1996) assessed the relationship between Hong Kong house prices and mortgage flows under deposit rate ceiling and linked exchange rate. The study found a negative association between exchange rate and deposit. Based on it, the study develops the following hypothesis.

H<sub>5</sub>: There is a negative relationship between exchange rate and level of deposit.

## Remittances

Aggarwal et al. (2011) examined the effect of remittances on financial development. The study revealed that there is a positive effect of remittances on net interest margin and deposit growth. Similarly, Githaiga and Kabiru (2014) revealed that remittances have a positive and insignificant impact on bank deposits. In addition, Fromentin (2017) analyzed the long-run and short-run impacts of remittances on financial development in developing countries. The study showed a significant positive association between remittances and bank deposits. Furthermore, Karikari et al. (2016) revealed a positive impact of remittances on deposit growth. Based on it, the study develops the following hypothesis.

H<sub>6</sub>: There is a positive relationship between remittance and level of deposit.

# 3. Results and discussion

## Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 20 Nepalese commercial banks for the study period of 2013/14 to 2020/21. The dependent variables are TD (Total deposits, Rs in billion) and DGR (Deposit growth rate, in percentage). The independent variables are GDP (Gross domestic product growth rate, in percentage), XR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BM (Money supply as measured by the broad money to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage) and RE (Remittance inflow, Rs in billion).

| Variables | Minimum | Maximum | Mean    | Std. Deviation |
|-----------|---------|---------|---------|----------------|
| TD        | 17.148  | 17.148  | 300.252 | 96.692         |
| DGR       | -7.847  | -7.847  | 82.044  | 22.805         |
| GDP       | -2.400  | -2.400  | 9.000   | 4.438          |
| INF       | 3.600   | 3.600   | 9.930   | 6.145          |
| IR        | 3.280   | 3.280   | 6.600   | 5.151          |
| BM        | 15.500  | 15.500  | 21.800  | 18.638         |
| XR        | 97.930  | 97.930  | 117.730 | 107.583        |
| RE        | 388.460 | 388.460 | 879.000 | 694.051        |

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 20 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are TD (Total deposits, Rs in billion) and DGR (Deposit growth rate, in percentage). The independent variables are GDP (Gross domestic product growth rate, in percentage), XR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BM (Money supply as measured by the broad money to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage) and RE (Remittance inflow, Rs in billion).

| Variables | TD       | DGR      | GDP      | INF      | IR       | BM      | XR      | RE |
|-----------|----------|----------|----------|----------|----------|---------|---------|----|
| TD        | 1        |          |          |          |          |         |         |    |
| DGR       | -0.026   | 1        |          |          |          |         |         |    |
| GDP       | -0.208** | -0.222** | 1        |          |          |         |         |    |
| INF       | -0.509** | 0.169*   | -0.444** | 1        |          |         |         |    |
| IR        | 0.314**  | -0.114   | 0.365**  | -0.769** | 1        |         |         |    |
| BM        | 0.139    | 0.076    | -0.332** | 0.170*   | -0.615** | 1       |         |    |
| XR        | 0.723**  | -0.004   | -0.390** | -0.532** | 0.388**  | 0.002   | 1       |    |
| RE        | 0.678**  | -0.042   | -0.242** | -0.635** | 0.566**  | -0.156* | 0.951** | 1  |

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

Table 3 reveals that gross domestic product growth rate has a negative relationship with total deposit. It means that increase in gross domestic product leads to decrease in total deposit. However, there is a negative relationship between inflation rate and total deposit. It means that increase in inflation rate leads to decrease in total deposit. However, money supply has a positive relationship with total deposit. It shows



that increase in money supply leads to increase in total deposit. Furthermore, there is a positive relationship between exchange rate and total deposit. It indicates that increase in exchange rate leads to increase in total deposit. In addition, interest rate has a positive relationship with total deposit. It indicates that increase in interest rate leads to decrease in total deposit. Further, this study shows that there is a positive relationship between remittance and total deposit. It means that increase in remittance leads to increase in total deposit in Nepalese commercial banks.

Similarly, the result also shows that gross domestic product growth rate has a negative relationship with deposit growth rate. It indicates that increase in gross domestic product growth rate leads to decrease in deposit growth rate. On the other hand, there is a positive relationship between inflation rate and deposit growth rate. It indicates that increase in inflation rate leads to increase in deposit growth rate. In addition, money supply is positively related to deposit growth rate. It shows that increase in money supply leads to increase in deposit growth rate. Furthermore, there is a negative relationship between exchange rate and deposit growth rate. It indicates that increase in exchange rate leads to decrease in deposit growth rate. Besides, interest rate has a positive relationship with deposit growth rate. It means that increase in interest rate leads to increase in deposit growth rate. However, there is a negative relationship between remittance and deposit growth rate. It means that increase in remittance leads to decrease in deposit growth rate in Nepalese commercial banks.

## **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 GDP growth rate, exchange rate, broad money, inflation, interest rate, and remittance with total deposits of Nepalese commercial banks.

**Table 4:** Estimated regression results of GDP growth rate, exchange rate, broad money, inflation, interest rate, and remittance with total deposits

The results are based on panel data of 20 commercial banks with 160 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is  $TD = \beta_0 + \beta_1 GDP_i + \beta_2 XR_i + \beta_3 BM_i + \beta_4 INF_i + \beta_5 IR_i + \beta_6 RE_i + e_i$  where, the dependent variable is TD (Total deposits, Rs in billion). The independent variables are GDP (Gross domestic product growth rate, in percentage), XR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BM (Money supply as measured by the broad money to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage) and RE (Remittance inflow, Rs in billion).

| Model | Inter-cept           | Regression coefficients of |                     |                   |                  |                   |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|----------------------|----------------------------|---------------------|-------------------|------------------|-------------------|-------------------|-------------------------|-------|---------|
|       |                      | GDP                        | INF                 | IR                | BM               | XR                | RE                |                         |       |         |
| 1     | 10.57<br>(16.62)**   | -3.13<br>(2.68)**          |                     |                   |                  |                   |                   | 0.04                    | 52.69 | 7.17    |
| 2     | 172<br>(15.95)**     |                            | -12.26<br>(7.42)**  |                   |                  |                   |                   | 0.25                    | 46.38 | 55.17   |
| 3     | 25.97<br>(1.48)      |                            |                     | 13.73<br>(4.15)** |                  |                   |                   | 0.09                    | 51.16 | 17.24   |
| 4     | 26.47<br>(0.66)      |                            |                     |                   | 3.77<br>(1.77)   |                   |                   | 0.01                    | 53.35 | 3.13    |
| 5     | -504.02<br>(11.02)** |                            |                     |                   |                  | 5.58<br>(13.16)** |                   | 0.52                    | 37.21 | 173.14  |
| 6     | -50.09<br>(3.84)**   |                            |                     |                   |                  |                   | 0.21<br>(11.58)** | 0.46                    | 39.62 | 134.1   |
| 7     | 243.66<br>(19.87)**  | -8.12<br>(8.53)**          | -18.05<br>(11.82)** |                   |                  |                   |                   | 0.49                    | 38.46 | 76.53   |
| 8     | -317.26<br>(5.51)**  |                            |                     | 28.09<br>(7.45)** | 14.45<br>(6.2)** |                   |                   | 0.27                    | 46    | 29.88   |
| 9     | -566.75<br>(5.05)**  |                            |                     |                   |                  | 6.39<br>(4.62)**  | 0.34<br>(0.61)    | 0.52                    | 37.29 | 86.41   |
| 10    | -492.52<br>(4.33)**  |                            |                     |                   | 4.44<br>(2.60)*  | 4.38<br>(2.81)**  | 0.051<br>(0.085)  | 0.54                    | 36.62 | 61.98   |
| 11    | -773.19<br>(5.59)**  |                            |                     | 13.46<br>(3.37)** | 7.69<br>(4.02)** | 6.66<br>(4.02)**  | 0.085<br>(1.15)   | 0.56                    | 35.46 | 52.43   |
| 12    | -695.88<br>(3.13)**  | -0.18<br>(0.96)            | -3.12<br>(0.72)     | 7.78<br>(1.19)    | 6.16<br>(2.29)*  | 6.68<br>(3.59)**  | 0.91<br>(1.22)    | 0.56                    | 35.48 | 35.22   |

**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 deposit is the dependent variable.

Table 4 shows that the beta coefficients for gross domestic product are negative with total deposits. It indicates that gross domestic product has a negative impact on total deposits. This finding contradicts with the findings of Kumar and Chauhan (2015). The beta coefficients for money supply are positive with total deposits. It indicates that money supply has a positive impact on total deposits. This finding is similar to the findings of Islam et al. (2019). Similarly, the beta coefficients for exchange rate are positive with total deposits. It indicates that exchange rate has a positive impact on total deposits. This finding is similar to the findings of Raymond (1996). Likewise, the beta coefficients for remittance are positive with total deposits. It indicates that remittance has a positive impact on total deposits. This finding is consistent with the

findings of Fromentin (2017). On the other hand, the beta coefficients for inflation rate are negative with total deposits. It indicates that inflation rate has a negative impact on total deposits. This finding is similar to the findings of Haron and Azmi (2008). Similarly, the beta coefficients for interest rate are positive with total deposits. It indicates that interest rate has a positive impact on total deposits. This finding is consistent with the findings of Mashamba et al. (2014).

Table 5 shows the estimated regression results of GDP growth rate, exchange rate, broad money, inflation, interest rate, and remittance on deposit growth rate of Nepalese commercial banks.

**Table 5:** Estimated regression results of GDP growth rate, exchange rate, broad money, inflation, interest rate and remittance on deposit growth rate

The results are based on panel data of 20 commercial banks with 160 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is  $DGR = \beta_0 + \beta_1 GDP_t + \beta_2 XR_t + \beta_3 BM_t + \beta_4 INF_t + \beta_5 IR_t + \beta_6 RE_t + e_t$  where, the dependent variable is DGR (Deposit growth rate, in percentage). The independent variables are GDP (Gross domestic product growth rate, in percentage), XR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), BM (Money supply as measured by the broad money to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), IR (Interest rate as measured by the lending cost of the bank, in percentage) and RE (Remittance inflow, Rs in billion).

| Model | Inter-cept         | Regression coefficients of |                 |                   |                 |                  |                 | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|-----------------|-------------------|-----------------|------------------|-----------------|-------------------------|-------|---------|
|       |                    | GDP                        | INF             | IR                | BM              | XR               | RE              |                         |       |         |
| 1     | 26.79<br>(15.02)** | -0.89<br>(2.87)**          |                 |                   |                 |                  |                 | 0.04                    | 14.12 | 8.21    |
| 2     | 16.06<br>(4.84)**  |                            | 1.10<br>(2.16)* |                   |                 |                  |                 | 0.02                    | 14.27 | 4.67    |
| 3     | 29.7<br>(6.03)**   |                            |                 | -1.34<br>(1.44)   |                 |                  |                 | 0.01                    | 14.38 | 2.07    |
| 4     | 12.57<br>(1.16)    |                            |                 |                   | 0.55<br>(0.95)  |                  |                 | 0.01                    | 14.44 | 0.91    |
| 5     | 23.6<br>(1.32)     |                            |                 |                   |                 | -0.07<br>(0.045) |                 | 0.01                    | 14.48 | 0.02    |
| 6     | 25.28<br>(5.37)**  |                            |                 |                   |                 |                  | -0.04<br>(0.53) | 0.01                    | 14.46 | 0.28    |
| 7     | 22.58<br>(5.01)**  | -0.74<br>(2.12)*           | 0.57<br>(1.02)  |                   |                 |                  |                 | 0.04                    | 14.12 | 4.62    |
| 8     | 28.12<br>(1.56)    |                            |                 | -1.27<br>(1.07)   | 0.066<br>(0.09) |                  |                 | 0.01                    | 14.43 | 1.04    |
| 9     | -39.9<br>(0.92)    |                            |                 |                   |                 | -0.8<br>(1.51)   | -0.035<br>(1.6) | 0.01                    | 14.41 | 1.28    |
| 10    | 38.17<br>(0.85)    |                            |                 |                   | 0.10<br>(0.15)  | -0.76<br>(1.23)  | -0.03<br>(1.30) | 0.03                    | 14.45 | 4.86    |
| 11    | -17.87<br>(0.32)   |                            |                 | -0.98<br>(2.36)*  | -0.13<br>(0.17) | -0.59<br>(0.89)  | -0.20<br>(0.75) | 0.21                    | 14.49 | 10.73   |
| 12    | 5.99<br>(0.07)     | -1.01<br>(2.36)*           | 0.45<br>(0.26)  | -1.61<br>(2.61)** | 0.24<br>(0.22)  | -0.17<br>(0.22)  | -0.02<br>(0.58) | 0.33                    | 14.25 | 21.17   |

**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.
- Deposit growth rate is the dependent variable.

Table 5 shows that the beta coefficients for gross domestic product are negative with deposit growth rate. It indicates that gross domestic product has a negative impact on deposit growth rate. This finding is similar to the findings of Menza (2019). The beta coefficients for money supply are positive with deposit growth rate. It indicates that money supply has a positive impact on deposit growth rate. This finding is similar to the findings of Ericsson et al. (1998). Similarly, the beta coefficients for exchange rate are negative with deposit growth rate. It indicates that exchange rate has a negative impact on deposit growth rate. This finding is similar to the findings of Ibekwe (2021). Likewise, the beta coefficients for remittance are negative with deposit growth rate. It indicates that remittance has a negative impact on deposit growth rate. This finding is consistent with the findings of Githaiga and Kabiru (2014). On the other hand, the beta coefficients for inflation rate are positive with deposit growth rate. It indicates that inflation rate has a positive impact on deposit growth rate. This finding is similar to the findings of bdudh et al. (2011). Similarly, the beta coefficients for interest rate are negative with deposit growth rate. It indicates that interest rate has a negative impact on deposit growth rate. This finding is consistent with the findings of Chinyere (2015).

## 4. Summary and conclusion

An efficient financial system is essential for building a sustained economic growth and an open vibrant economic system. Countries with well-developed financial institutions tend to grow faster; especially the size of the banking system and the liquidity of the stock markets tend to have strong positive impact on economic growth.

This study attempts to analyze the impact of macro-economic factors on the level of deposit of Nepalese commercial banks. The study is based on secondary data of 20 commercial banks with 160 observations for the period from 2013/14 to 2020/21.

The study showed that exchange rate, broad money, interest rate, and remittance have positive impact on total deposits. However, GDP growth rate and inflation rate have negative impact on total loan to total asset. Likewise, broad money and inflation rate have positive impact on total deposits. However, GDP growth rate, exchange rate, interest rate, and remittance have negative impact on deposit growth rate. Likewise, the study also concluded that exchange rate followed by remittance is the most influencing factor that explains the changes in the total deposits of Nepalese commercial banks. Similarly, the study also concluded that GDP growth rate followed by inflation rate is the most influencing factor that explains the changes in the deposit growth rate in context of Nepalese commercial banks.

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## Abstract

*This study examines the effect of market risk on the profitability of Nepalese commercial banks. Return on asset and return on equity are selected as the dependent variables. Similarly, leverage, net interest margin, inflation, exchange rate, interest rate and bank size are selected as the independent variables. This study is based on secondary data of 15 commercial banks with 120 observations for the study period from 2013/14 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of market risk on the profitability of Nepalese commercial banks.*

*The study showed that net interest margin has a positive impact on return on assets and return on equity. It means that increase in net interest margin leads to increase in return on assets and return on equity. Moreover, inflation has a negative impact on return on assets and return on equity. It shows that increase in inflation leads to decrease in return on assets and return on equity. Similarly, exchange rate has a negative impact on return on assets and return on equity. It indicates that increase in exchange rate leads to decrease in return on assets and return on equity. In addition, interest rate has a positive impact on return on assets and return on equity. It indicates that increase in lending interest rate leads to increase in return on assets and return on equity. Likewise, 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 of Nepalese commercial banks. Furthermore, leverage has a negative impact on return on assets. It means that increase in leverage ratio leads to decrease in return on assets.*

**Key words:** Return on assets, return on equity, leverage, net interest margin, inflation, exchange rate, interest rate and bank size.



# 1. Introduction

The financial system based on banks provides information regarding the investment opportunities. It directs resources to productivity channels resulting in facilitating the process of the economic growth (Beck et al., 2000). Risk management is recognized in today's business world as an internal part of good management practice. It entails the systematic application of management policies, procedures and practices to the tasks of identifying, analyzing, assessing, treating and monitoring risk (Haneef et al., 2012). Market risks occur owing to fluctuations in the financial market and are caused by a mismatch between the assets and liabilities of a business. The mismatch on compositions of assets and liabilities of any organization will determine the kind of exposure it has to various kinds of market volatilities. Market risks can also be described as the risk of losses in liquid portfolio arising from the movements in market prices. Fluctuations of the market cause losses of income generated from the assets held for investment and lead to the poor financial performance of the organization (Aykut, 2016). Market risk is inherent in every business and thus proper risk management strategies must be put in place to balance off risk. Market risk is often referred to as comprehensive risk because it is experienced by all companies and tends to affect the entire market simultaneously. Market risk, in particular, is a major component of financial risk. Since it is a systematic risk, it cannot be eliminated through diversification (Kassi et al., 2019).

Tan (2016) investigated the influence of risk and rivalry on the profitability of Chinese banks, namely, state owned, joint-stock, and city commercial banks from 2004 to 2012 using a GMM estimator. The study showed that market risk and competition did not influence bank profitability. However, factors such as taxation, overhead cost, labor productivity, including inflation have significant influence on the banks' profitability. In addition, Matar et al. (2018) assessed 44 commercial banks from the year 2006 to 2015 to understand financial risk. The study found that various trade cycles' credit risk negatively influences the performance. In contrast, there is a significant positive relationship of market risk and interest risk with performance. Similarly, Chepkemoi et al. (2019) investigated the impact of market risk on the financial performance of non-bank financial institutions (NBFIs) listed on the Nairobi Stock Exchange (NSE) from 2012 to 2017. In this study, the degree of financial leverage (DFL) indicators was used to measure market risk. The study showed that financial leverage is positively associated with NBFIs performance. Correspondingly, the study showed that interest risk has the most significant influence on Kenya's NBFIs financial performance.

Kassi et al. (2019) explored 31 non-financial companies listed on Casablanca Stock Exchange (CSE) from 2000 to 2016 to understand market risk effects on the financial performance of banks. Three market risk indicators were used, namely, DFL, book-to-market ratio, and gearing ratio. The study showed a significant negative relationships of market risk on the companies' financial performance. In addition, Ahmed et al. (2018) assessed annual data of seven years from 2007 to 2014 to understand the impact of interest rate fluctuations on bank profitability in Pakistan. The study found that bank profitability reduced because of deposits with other banks and interest rates. Meanwhile, advances, loans, and investment have positive effect on the bank profitability. Moreover, Kalsoom and Khurshid (2016) assessed the effect of market risks on the profitability of banks listed on the ASE from 2010 to 2018. The results indicated that the standard deviation of returns before taxes on assets, book value of equity to total assets were significantly related to market measures of systematic and total risk. The study concluded that only the book value of equity to total asset ratio was significantly related to non-systematic measures of risk.

Market risk which comprises of exchange rate, inflation and interest rates affect the financial performance of banks (Aruwa and Musa, 2014). Ahmet (2016) found that market risk affects the financial performance

of conventional financial firms more than Islamic financial firms in Turkey. Al-Rdaydeh et al. (2022) examined the effect of market risks on bank profitability in Jordan. The study also examined the effects of exchange rate risks, interest rate risks, stock return risk, bank size and bank capitalization on return on assets and return on equity. The study found that market risk indicators such as interest volatility, exchange rate unpredictability, and stock numbers volatility have significant effect on the profitability of banks. Similarly, Muriithi et al. (2016) assessed the effect of market risk on financial performance of commercial banks in Kenya. The study found that financial leverage, interest rate and foreign exchange exposure have negative and significant relationship with bank profitability. In addition, Nimalathasan and Pratheepkanth (2012) analyzed the effect of market risk on the return of equity of listed financial institutions in Sri Lanka over the period 2007-2011. The study found a significant positive association between market risk and companies' financial performance. Moreover, Bhatti et al. (2010) assessed the relationship between financial leverage, systematic risk and profitability of eight non-financial enterprises in Pakistan from January 2005 to December 2009. The study showed a significant positive link between financial leverage and systematic risk.

Mesa et al. (2013) found that net interest margin is positively related to the profitability of the bank. Similarly, Bandaranayake and Jayasinghe (2013) found that there is a positive relationship between net interest margin and the efficiency of the commercial banks of Sri Lanka. According to Williams (2003), there is a positive relationship between return on assets and net interest margin of banks. Furthermore, Saksonova (2014) concluded that there is a positive impact of net interest margin in maintaining the stability of the bank. The study also revealed that there is a positive relationship between net interest margin and bank efficiency. Fisseha (2015) analyzed the profitability of commercial banks on the basis of bank size, capital adequacy, liquidity risk, credit risk, management efficiency, labor efficiency, inflation rate and real GDP rate. The study showed a positive impact of bank size, capital adequacy and liquidity risk on the profitability of commercial banks. Goddard et al. (2004) stated that banks holding a high proportion of capital are unlikely to earn high profits. In contrast to this view, Berger (1995) revealed that there is a positive relationship between the level of capital and earnings in banks. Well capitalized banks face lower bankruptcy costs, which reduces the cost of funding and thereby increasing the profitability. According to Ozili (2017), when the quality of lending is not good in a given market, high loan loss provisions could occur, which could lead to higher non-performing loans, eventually leading towards lower bank profitability. Diamond and Raghuram (2000) opined that there is a negative relationship between liquidity risk and net interest margin. Those liquidity holdings, imposed by the regulatory authorities, represent an opportunity cost to the banks which reduces the bank profitability (Molyneux and Thornton, 1992). Furthermore, Gup and Kolari (2005) found that overhead cost is highly significant and negatively related to bank profitability measured by return on equity and net interest margin.

In the context of Nepal, Bajagai et al. (2019) analyzed the impact of credit risk, liquidity risk and market on the profitability of Nepalese commercial banks. The study found that bank size and net interest margin are positively related to net profit after tax. The study also found that non-performing loans and credit to core capital deposit ratio have negative impact on return on equity. Moreover, Kunwar (2018) determined the factors affecting profitability of Nepalese commercial banks. The study revealed that inflation, liquidity, and non-performing loans have negative relationship with bank profitability. However, credit to deposit ratio, market share and GDP have positive relationship with bank profitability. According to Neupane (2013), there is a positive relationship between capital adequacy ratio and efficiency. Furthermore, profitable banks with lower leverage and higher capital adequacy ratio found to be more efficient and bank loans seem to be more highly valued than alternative bank outputs i.e., investments and securities.

The above discussion shows that empirical evidences vary greatly across the studies concerning the effect of market risks 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 examine the effect of market risk on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of leverage, net interest margin, inflation, exchange rate, interest rate and bank size with return on asset 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 the conclusion.

## 2. Methodological aspects

The study is based on secondary data which were gathered from 15 commercial banks from 2016/17 to 2020/21, leading to a total of 120 observations. The study used stratified sampling method to select the banks. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|-------------------------------------|-------------------------------|-------------------|--------------|
| <b>Public banks</b>                 |                               |                   |              |
| 1                                   | Rastriya Banijya Bank Limited | 2013/14 - 2020/21 | 8            |
| 2                                   | Nepal Bank Limited            | 2013/14 - 2020/21 | 8            |
| <b>Joint venture banks</b>          |                               |                   |              |
| 3                                   | Nabil Bank Limited            | 2013/14 - 2020/21 | 8            |
| 4                                   | NMB Bank Limited              | 2013/14 - 2020/21 | 8            |
| 5                                   | Himalayan Bank Limited        | 2013/14 - 2020/21 | 8            |
| 6                                   | Everest Bank Limited          | 2013/14 - 2020/21 | 8            |
| <b>Private banks</b>                |                               |                   |              |
| 7                                   | NIC Asia Bank Limited         | 2013/14 - 2020/21 | 8            |
| 8                                   | Global IME Bank Limited       | 2013/14 - 2020/21 | 8            |
| 9                                   | Siddhartha Bank Limited       | 2013/14 - 2020/21 | 8            |
| 10                                  | Nepal Investment Bank Limited | 2013/14 - 2020/21 | 8            |
| 11                                  | Prabhu Bank Limited           | 2013/14 - 2020/21 | 8            |
| 12                                  | Kumari Bank Limited           | 2013/14 - 2020/21 | 8            |
| 13                                  | Prime Commercial Bank Limited | 2013/14 - 2020/21 | 8            |
| 14                                  | Sanima Bank Limited           | 2013/14 - 2020/21 | 8            |
| 15                                  | Mega Bank Nepal Limited       | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                               |                   | <b>120</b>   |

Thus, the study is based on the 120 observations.

## The model

The model used in this study assumes that bank profitability depends upon market risk. The dependent variables selected for the study are return on asset and return on equity. Similarly, the selected independent variables are leverage, net interest margin, inflation, exchange rate, interest rate and bank size. Therefore, the model takes the following form:

Bank profitability =  $f(\text{LEV}, \text{NIM}, \text{INF}, \text{EXR}, \text{INTR}$  and  $\text{BSZ})$

More specifically, the given model has been segmented into following models:

$$\text{ROA} = \beta_0 + \beta_1 \text{LEV} + \beta_2 \text{NIM} + \beta_3 \text{INF} + \beta_4 \text{EXR} + \beta_5 \text{INTR} + \beta_6 \text{BSZ} + e_{it}$$

$$\text{ROE} = \beta_0 + \beta_1 \text{LEV} + \beta_2 \text{NIM} + \beta_3 \text{INF} + \beta_4 \text{EXR} + \beta_5 \text{INTR} + \beta_6 \text{BSZ} + e_{it}$$

Where,

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 shareholders' equity, in percentage.

LEV = Leverage as measured by the ratio of total debt to total assets, in percentage.

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

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

EXR = Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD.

INTR = Interest rate as measured by the lending rate of the bank, in percentage.

BSZ = Bank size as measured by the total assets of bank, Rs in million.

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

## Leverage

Leverage has the probability of enhancing the performance of firms if well-structured and managed (Ebiringa and Ezeji, 2012). Carson and Hoyt (1995) found that leverage is significantly and negatively related to the probability. According to Salim and Yadav (2012), there is a negative association between financial leverage and firm value. Moreover, Browne et al. (2001) observed a negative relationship between debt ratio and performance. Frank and Goyal (2009) examined the effect of capital structure decisions on firm profitability. The study found that there is a negative relationship between the leverage and the profitability of firms. Sen and Ranjan (2018) concluded that there is negative and significant impact of financial leverage on firm profitability. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a negative relationship between leverage and bank profitability.

## Net interest margin

Net interest margin serves as an indicator of performance, more specifically, efficiency of the banking industry (Sensarma and Ghosh, 2004). Too high NIM is reflective of lack of competition in the industry. However, too low NIM can also put a stress on the profitability of banks. Boateng (2018) found that net interest margin has a positive and significant effect on bank profitability. Musah et al. (2018) found that net interest margin has a positive and significant impact on ROA and ROE. Likewise, Supriyono and Herdhayinta (2019) analyzed the determinants of profitability of the regional development bank in

Indonesia. The study found that net interest margin has a significant positive relationship with profitability. Similarly, Setiawan and Hermanto (2017) found that net interest margin has a positive and significant effect on bank profitability. Moreover, Sari and Endri (2019) found that net interest margin has a positive and significant impact on return on assets. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between net interest margin and bank profitability.

## **Inflation**

Inflation in the economy has a significant effect on profitability of banks. Vong and Chan (2009) found that there is a positive relationship between inflation and bank performance. Moreover, Perry (1992) found that inflation has a significant positive effect on banking profitability. Furthermore, Sufian and Kamarudin (2012) revealed that there is a significant positive relationship with bank profitability. Moreover, Alper and Anbar (2011) found that inflation rates would lead to an increase in commercial banks' profitability. Similarly, Fadzman and Khazanah (2009) showed that there is a positive impact of economic growth and inflation on bank profitability. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between inflation and bank profitability.

## **Exchange rate**

Exchange rate is another market risks factor that influences profitability of commercial banks. Simiyu and Ngile (2015) indicated that exchange rate has a positive significant effect on profitability. Similarly, Aburime (2008) found that exchange rate regime has a significant and positive influence on profitability. In addition, Athanasoglou et al. (2006) found that exchange rates positively influence the profitability of banking sector. Mohammadi et al. (2016) found that exchange rate volatility has the positive impact on the non-performing loan. Moreover, Taiwo and Adesola (2013) found that there is positive relationship between exchange rate and bank profitability. Acaravci and Calim (2013) showed that real exchange rate has significant positive effect on bank profitability. Similarly, Babazadeh and Farrokhnejad (2012) revealed that exchange rate is significant positive determinant of profits. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is positive relationship between exchange rate and bank profitability.

## **Interest rate**

Interest rate is a core factor affecting bank profitability. Punita and Somaiya (2006) found that bank interest rate has a positive and significant impact on performance. Similarly, Staikouras and Wood (2004) showed that interest rate has positive significant impact on bank profitability. Furthermore, Borio et al. (2017) concluded interest rate has positive relationship with profitability. Prasetyantoko and Parmono (2012) concluded that interest rate is positively related to firm performance. Okoye and Eze (2013) found a positive and significant relationship between bank rate and bank performance in both short term and long term. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is positive relationship between interest rate and bank profitability.

## Bank size

Size is observed as a major determinant of performance in any firm. It has always been the objectives of the firms to multiply in size in order to have an edge over their competitors. Akinlo (2010) investigated the long-run relationship and causality issues between firm size and profitability in 66 firms in Nigeria by using the panel co-integration method between 1999 and 2007. The empirical result showed that there is a positive and long run relationship between firm size and profitability. Similarly, Obehioye and Osahon (2013) investigated the determinants of corporate profitability in developing economies. The study found that firm size has a positive impact on the return on assets. Moreover, Ekwe and Duru (2012) argued that there is a strong positive relationship between firm size and profitability. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between bank size and profitability.

## 3. Results and discussion

### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total shareholders' equity, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), INTR (Interest rate as measured by the lending rate of the bank, in percentage), BSZ (Bank size as measured by the total assets of bank, Rs in million).

| Variables | Minimum | Maximum | Mean      | S. D.    |
|-----------|---------|---------|-----------|----------|
| ROA       | 0.55    | 2.89    | 1.62      | 0.46     |
| ROE       | 7.57    | 55.31   | 18.17     | 6.53     |
| LEV       | 0.83    | 0.98    | 0.89      | 0.03     |
| NIM       | 1.87    | 5.09    | 3.13      | 0.55     |
| INF       | 3.60    | 9.93    | 6.15      | 2.23     |
| EXR       | 98.30   | 118.20  | 107.78    | 6.94     |
| INTR      | 5.00    | 8.00    | 6.89      | 1.09     |
| BSZ       | 20571   | 346147  | 128296.36 | 70678.28 |

### Correlation analysis

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

**Table 3: Pearson's correlation coefficients matrix**

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 15 Nepalese commercial banks for the study period from 2013/14 to 2020/21. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total shareholders' equity, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), INTR (Interest rate as measured by the lending rate of the bank, in percentage), BSZ (Bank size as measured by the total assets of bank, Rs in million).

| Variables | ROA      | ROE      | LEV      | NIM     | INF      | EXR      | INTR     | BSZ |
|-----------|----------|----------|----------|---------|----------|----------|----------|-----|
| ROA       | 1        |          |          |         |          |          |          |     |
| ROE       | 0.445**  | 1        |          |         |          |          |          |     |
| LEV       | -0.072   | 0.452**  | 1        |         |          |          |          |     |
| NIM       | 0.530**  | 0.216*   | 0.040    | 1       |          |          |          |     |
| INF       | -0.081   | -0.323** | 0.429**  | 0.061   | 1        |          |          |     |
| EXR       | -0.277** | -0.301** | -0.345** | -0.211* | -0.540** | 1        |          |     |
| INTR      | 0.323**  | 0.328**  | -0.326** | 0.266** | 0.507**  | -0.968** | 1        |     |
| BSZ       | 0.211*   | 0.118    | -0.148   | -0.080  | -0.554** | 0.788**  | -0.796** | 1   |

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

Table 3 shows that leverage is negatively correlated to return on asset. It means that increase in leverage ratio leads to decrease in return on asset. Similarly, there is a positive relationship between net interest margin and return on assets. It means that increase in net interest margin leads to increase in return on assets. Moreover, inflation has a negative relationship with return on assets. It shows that increase in inflation leads to decrease in return on assets. Furthermore, there is a negative relationship between exchange rate and return on assets. It indicates that increase in exchange rate leads to decrease in return on assets. In addition, interest rate has a positive relationship with return on assets. It indicates that increase in lending interest rate leads to increase in return on assets. Likewise, there is a positive relationship between bank size and return on assets. It means that increase in bank size leads to increase in return on assets of Nepalese commercial banks.

On the other hand, the result also shows that leverage is positively correlated to return on equity. It means that increase in leverage ratio leads to increase in return on equity. Similarly, there is a positive relationship between net interest margin and return on equity. It means that increase in net interest margin leads to increase in return on equity. Moreover, inflation has a negative relationship with return on equity. It shows that increase in inflation leads to decrease in return on equity. Furthermore, there is a negative relationship between exchange rate and return on equity. It indicates that increase in exchange rate leads to decrease in return on equity. In addition, interest rate has a positive relationship with return on equity. It indicates that increase in lending interest rate leads to increase in return on equity. Likewise, there is a positive relationship between bank size and return on equity. It means that increase in bank size leads to increase in return on equity of Nepalese commercial banks.

## 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 leverage, net



interest margin, inflation rate, exchange rate, interest rate and bank size with return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of leverage, net interest margin, inflation rate, exchange rate, interest rate and bank size with return on assets

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $ROA = \beta_0 + \beta_1 LEV + \beta_2 NIM + \beta_3 INF + \beta_4 EXR + \beta_5 INTR + \beta_6 BSZ + e_a$  where, the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total assets, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), INTR (Interest rate as measured by the lending rate of the bank, in percentage), BSZ (Bank size as measured by the total assets of bank, Rs in million).

| Model | Intercept           | Regression coefficients of |                    |                   |                     |                    |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|--------------------|-------------------|---------------------|--------------------|-------------------|-------------------------|-------|---------|
|       |                     | LEV                        | NIM                | INF               | EXR                 | INTR               | BSZ               |                         |       |         |
| 1     | 2.669<br>(1.989)*   | -1.163<br>(0.779)          |                    |                   |                     |                    |                   | 0.003                   | 0.464 | 0.607   |
| 2     | 0.23<br>(1.108)     |                            | 0.446<br>(6.794)** |                   |                     |                    |                   | 0.275                   | 0.395 | 46.159  |
| 3     | 1.520<br>(12.198)** |                            |                    | -0.017<br>(0.886) |                     |                    |                   | 0.002                   | 0.464 | 0.786   |
| 4     | 3.621<br>(5.673)**  |                            |                    |                   | -0.239<br>(3.135)** |                    |                   | 0.069                   | 0.447 | 9.826   |
| 5     | 0.707<br>(2.823)**  |                            |                    |                   |                     | 0.137<br>(3.712)** |                   | 0.097                   | 0.440 | 13.778  |
| 6     | 2.420<br>(3.044)**  |                            |                    |                   |                     |                    | 0.069<br>(1.002)  | 0.001                   | 0.463 | 1.005   |
| 7     | 1.577<br>(1.371)    | -1.508<br>(1.190)          | 0.449<br>(6.848)** |                   |                     |                    |                   | 0.278                   | 0.394 | 23.869  |
| 8     | 3.354<br>(2.346)*   | -2.118<br>(1.287)          |                    | -0.029<br>(1.355) |                     |                    |                   | 0.004                   | 0.463 | 1.224   |
| 9     | 4.119<br>(4.913)**  |                            |                    | -0.020<br>(0.918) | -0.220<br>(3.132)** |                    |                   | 0.068                   | 0.447 | 5.328   |
| 10    | -3.318<br>(2.305)*  |                            |                    |                   |                     | 0.258<br>(4.634)** | 0.278<br>(2.837)* | 0.148                   | 0.428 | 11.325  |
| 11    | 2.127<br>(1.733)    | -2.260<br>(1.617)          | 0.445<br>(6.795)** | -0.023<br>(1.260) |                     |                    |                   | 0.281                   | 0.392 | 16.521  |
| 12    | 1.896<br>(2.333)*   |                            | 0.412<br>(6.213)** | -0.012<br>(0.655) | -0.140<br>(2.201)*  |                    |                   | 0.294                   | 0.389 | 17.558  |
| 13    | -4.435<br>(1.248)   |                            |                    | -0.016<br>(0.746) | -0.034<br>(1.446)   | 0.366<br>(2.474)*  |                   | 0.107                   | 0.438 | 5.748   |
| 14    | -6.992<br>(-2.018)* |                            |                    |                   | -0.027<br>(1.166)   | 0.413<br>(2.859)*  | 0.255<br>(2.556)* | 0.150                   | 0.427 | 8.026   |
| 15    | 4.529<br>(2.948)**  | -2.778<br>(2.009)          | 0.410<br>(6.258)   | -0.001<br>(0.018) | -0.016<br>(2.505)*  |                    |                   | 0.313                   | 0.384 | 14.523  |
| 16    | -3.448<br>(1.025)   |                            | 0.368<br>(5.202)** | -0.003<br>(0.145) | -0.011<br>(0.496)   | 0.209<br>(1.515)   | 0.120<br>(1.213)  | 0.301                   | 0.387 | 11.269  |
| 17    | -0.872<br>(0.253)   | -3.567<br>(2.503)*         | 0.510<br>(5.055)** | -0.018<br>(0.825) | -0.007<br>(0.316)   | 0.228<br>(1.689)   | 0.195<br>(1.918)  | 0.332                   | 0.379 | 10.869  |

**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 asset is the dependent variable.

Table 4 shows that the beta coefficients for leverage are negative with return on asset. It indicates that leverage has a negative impact on return on asset. This finding is similar to the findings of Browne et al. (2001). The beta coefficients for net interest margin are positive with return on asset. It indicates that net interest margin has a positive impact on return on asset. This finding is consistent with the findings of Musah et al. (2018). Similarly, the beta coefficients for inflation are negative with return on asset. It indicates that inflation has a negative impact on return on asset. This finding is inconsistent with the findings of Alper and Anbar (2011). Likewise, the beta coefficients for interest rate are positive with return on asset. It indicates that interest rate has a positive impact on return on asset. This finding is consistent with the findings of Prasetyantoko and Parmono (2012). On the other hand, the beta coefficients for exchange rate are negative with return on asset. It indicates that exchange rate has a negative impact on return on assets. This finding is similar to the findings of Athanasoglou et al. (2006). Similarly, the beta coefficients for bank size are positive with return on asset. It indicates that bank size has a positive impact on return on assets. This finding is consistent with the findings of Obehioye and Osahon (2013).

Table 5 shows the estimated regression results of leverage, net interest margin, inflation rate, exchange rate, interest rate and bank size with return on equity of Nepalese commercial banks.

**Table 5:** Estimated regression results of leverage, net interest margin, inflation rate, exchange rate, interest rate and bank size with return on equity

The results are based on panel data of 15 commercial banks with 120 observations for the period of 2013/14 to 2020/21 by using the linear regression model and the model is  $ROA = \beta_0 + \beta_1 LEV + \beta_2 NIM + \beta_3 INF + \beta_4 EXR + \beta_5 INTR + \beta_6 BSZ + e_t$  where, the dependent variable is ROE (Return on equity as measured by the ratio of net profit to total shareholders' equity, in percentage). The independent variables are LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage), INF (Inflation as measured by the change in consumer price index, in percentage), EXR (Exchange rate as measured by the rate of last day of each reporting fiscal year, in NPR/USD), INTR (Interest rate as measured by the lending rate of the bank, in percentage), BSZ (Bank size as measured by the total assets of bank, Rs in million).

| Model | Intercept             | Regression coefficients of |                   |                     |                     |                    |                    | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|-----------------------|----------------------------|-------------------|---------------------|---------------------|--------------------|--------------------|------------------------------------|-------|---------|
|       |                       | LEV                        | NIM               | INF                 | EXR                 | INTR               | BSZ                |                                    |       |         |
| 1     | -80.110<br>(4.734)**  | 1.094<br>(5.811)**         |                   |                     |                     |                    |                    | 0.216                              | 5.783 | 33.769  |
| 2     | 10.171<br>(3.009)**   |                            | 2.560<br>(2.404)* |                     |                     |                    |                    | 0.039                              | 6.401 | 5.780   |
| 3     | 12.361<br>(7.411)**   |                            |                   | -0.946<br>(3.706)** |                     |                    |                    | 0.097                              | 6.208 | 13.731  |
| 4     | 48.775<br>(5.464)**   |                            |                   |                     | -0.284<br>(3.435)** |                    |                    | 0.083                              | 6.254 | 11.799  |
| 5     | 5.066<br>(1.438)      |                            |                   |                     |                     | 1.960<br>(3.770)** |                    | 0.100                              | 6.197 | 14.211  |
| 6     | 29.900<br>(2.670)*8   |                            |                   |                     |                     |                    | 1.011<br>(1.049)   | 0.001                              | 6.529 | 1.099   |
| 7     | -80.712<br>(5.139)**  | 1.076<br>(5.841)**         | 2.354<br>(2.500)* |                     |                     |                    |                    | 0.249                              | 5.659 | 20.761  |
| 8     | 5.282<br>(1.514)      |                            | 2.334<br>(2.297)* | -0.910<br>(3.624)** |                     |                    |                    | 0.128                              | 6.098 | 9.753   |
| 9     | -60.542<br>(1.235)    |                            |                   |                     | -0.067<br>(0.205)   | 4.037<br>(1.974)*  | 3.838<br>(2.720)*  | 0.143                              | 6.046 | 7.633   |
| 10    | -65.426<br>(2.892)*   | 0.918<br>(4.487)**         | 2.126<br>(2.213)* | -0.305<br>(1.055)   | -0.69<br>(0.753)    |                    |                    | 0.256                              | 5.633 | 11.249  |
| 11    | -133.474<br>(2.687)** | 0.918<br>(4.512)*          | 1.752<br>(1.778)  | -0.332<br>(1.151)   | -0.386<br>(1.246)   | 2.995<br>(1.536)   |                    | 0.265                              | 5.599 | 9.578   |
| 12    | -107.279<br>(2.142)*  |                            | 0.671<br>(0.638)  | -1.079<br>(3.603)   | -0.235<br>(0.735)   | 4.494<br>(2.193)*  | 5.292<br>(3.581)** | 0.221                              | 5.764 | 7.763   |
| 13    | -159.876<br>(3.211)** | 0.758<br>(3.622)**         | 1.051<br>(1.045)  | -0.642<br>(2.079)   | -0.312<br>(1.025)   | 4.021<br>(2.059)*  | 3.633<br>(2.459)*  | 0.296                              | 5.48  | 9.342   |

**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 is the dependent variable.

Table 5 shows that 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 contradicts with the findings of Sen and Ranjan (2018). 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 consistent with the findings of Supriyono and Herdhayinta (2019). Similarly, the beta coefficients for inflation are negative with return on equity. It indicates that inflation has a negative impact on return on equity. This finding is inconsistent with the findings of Fadzlani and Khazanah (2009). Likewise, the beta coefficients for interest rate are positive with return on equity. It indicates that interest rate has a positive impact on return on equity. This finding is consistent with the findings of Punita and Somaiya (2006). On the other hand, the beta coefficients for exchange rate are negative with return on equity. It indicates that exchange rate has a negative impact on return on equity. This finding is similar to the findings of Acaravci and Calim (2013). Similarly, the beta coefficients for bank size are positive with return on asset. It indicates that bank size has a positive impact on return on assets. This finding is consistent with the findings of Ekwe and Duru (2012).

## 4. Summary and conclusion

Market risk is often referred to as comprehensive risk because it is experienced by all companies and tends to affect the entire market simultaneously. Market risk, in particular, is a major component of financial risk, and since it is a systematic risk, it cannot eliminate through diversification. Risk-taking is an inherent element of banking and, indeed, profits are in part the reward for successful risk-taking in business.

This study attempts to analyse the impact of market risk on the profitability of Nepalese commercial banks. The study is based on secondary data of 15 commercial banks with 120 observations for the period from 2013/14 to 2020/21.

The study showed that net interest margin, interest rate and bank size have positive impact on return on asset and return on equity. However, inflation rate and exchange rate have negative impact on return on asset and return on equity. Likewise, the study concluded that net interest margin followed by interest rate and exchange rate is the most influencing factor that explains the changes in the return on assets of Nepalese commercial banks. Similarly, the study also concluded that leverage followed by interest rate and inflation rate is the most influencing factor that explain the changes in the return on equity in context of Nepalese commercial banks.

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## Abstract

*This study examines the impact of macro-economic and bank specific factors on the credit growth of Nepalese commercial banks. Total loan and advances and loan growth are selected as dependent variables. Similarly, gross domestic product, inflation rate, money supply, capital adequacy ratio, non-performing loan and bank size are selected as the independent variables. This study is based on secondary data of 17 commercial banks with 119 observations for the study period from 2014/15 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of macro-economic and bank specific factors on the credit growth of Nepalese commercial banks.*

*The study showed that gross domestic product has a positive impact on total loan and advances. It means that increase in gross domestic product leads to increase in total loan and advances. Similarly, money supply has positive impact on total loan and advances and loan growth. It means that increase in money supply leads to increase in total loan and advances and loan growth. However, inflation has a negative impact on total loan and advances. It means that increase in inflation leads to decrease in total loan and advances. Moreover, capital adequacy ratio has a positive impact on total loan and advances. It means increase in capital adequacy ratio leads to increase in total loan and advances. In addition, non-performing loan has negative impact on loan growth. It means increase in non-performing loan leads to decrease in loan growth. Furthermore, bank size has a positive impact on total loan and advances. It means increase in bank size leads to increase in total loan and advances.*

**Key words:** Total loan and advances, loan growth, gross domestic product, money supply, inflation, capital adequacy ratio, non-performing loan and bank size.

# 1. Introduction

Credit is the aggregate amount of funds provided by financial institutions empowered with credit function to individuals, business organizations and government. The growth in credit provides several benefits to the economy, especially to the developing economies. Efficient allocation of credit boosts private investment and economic activity (Luca and Spatafora, 2012). Reliable supply of domestic credit relieves local firms from pressure coming from exchange rate risk especially during an economic downturn. It is also important to note that, credit growth can have negative effects on financial stability. Thus, factors that affect credit growth should be given due consideration as excess can affect negatively the financial sector and too little credit affect negatively macroeconomic indicators such as growth. Credit growth indicates a healthy banking system and a stable macroeconomic environment. Credit availability often spurs economic growth helping savings to be channelled into investment. However, a rapid credit growth can raise concerns about prudential risks, as it may decrease loan quality, increase systemic risk, and deteriorate bank soundness (Igan and Pinheiro, 2011).

Akinlo and Oni (2015) analysed the dominant factors influencing bank credit to private sector in Nigeria over the period 1980-2010 using the error correction modelling technique. The results showed that broad money, cyclical risk premium and liquidity ratio tend to increase credit to the private sector. However, prime lending rate and reserve ratio lead to a reduction in credit to the private sector. Similarly, Guo and Stepanyan (2011) showed that domestic and foreign funding has positive association with credit growth. The study found that stronger economic growth would lead to higher credit growth, while higher inflation would reduce real credit growth. Expansionary or loose monetary conditions either domestic or global leads to increase in credit. Moreover, Sharma and Gounder (2012) examined the determinants of credit growth for six Pacific Island countries (Fiji, Papua New Guinea, Solomon Islands, Vanuta, Samoa and Tonga). The study found that rising average lending and inflation rate could be detrimental to credit growth, while deposit and asset size would contribute positively to credit growth. The results also revealed that stronger economic growth would lead to higher credit growth. Oluitan (2013) examined the main factors that propels credit growth during 1970 – 2006 for thirty-three African countries. The study found that real export is inversely related to real private sector credit while real capital inflow and real imports is positively related to real private sector credit. Similarly, Stepanyan and Guo (2011) showed that domestic and foreign funding contribute positively and symmetrically to credit growth. The results also indicated that stronger economic growth leads to higher credit growth and high inflation, while increasing nominal credit is detrimental to real credit growth.

Oluitan (2013) examined the factors that propel credit growth using a panel data of 33 African countries over the period 1970-2006. The study showed that real export is inversely related to real private sector credit, while real capital inflow and real imports is positively related to real private sector credit. Similarly, Imran and Nishat (2013) empirically assessed the factors that explain bank credit to the private sector in Pakistan using annual data from 1971 to 2010. The study found that foreign liabilities, domestic deposits, economic growth, exchange rate, and monetary conditions are significantly associated with bank credit particularly in the long run, whereas inflation and money market rate does not affect the private credit. Furthermore, the results inferred that the financial health and liquidity of the banks play a significant and vital role in the determination of loan. Using a sample of European countries, Calza et al. (2001) showed that the long-run domestic credit is positively related to real GDP growth, but affected negatively by short-term and long-term real interest rates. Egert et al. (2006) investigated the determinants of domestic credit to the private sector as a percentage of GDP in eleven emerging European countries. The results indicated that

credit to the public sector, nominal interest rates, inflation rate and the spread between lending and deposit rates are the major determinants of credit growth in the CEE-5. However, GDP per capita is the only important factor for the Baltic and South-eastern European countries. Cucinelli (2015) investigated the inter-temporal relationship between bank lending behaviour and credit risk in Italy. The study found that the credit risk of previous years has a negative impact on bank lending behaviour. Furthermore, Cottarelli et al. (2005) showed that bank lending is positively related to GDP per capita and financial liberalisation but negatively affected by public debt.

Anwar and Nguyen (2009) applied panel data from 61 provinces and cities from 1997 to 2006 to investigate the relationship between financial development and economic growth. The study found a positive correlation between credit ratio, savings and economic growth in Vietnam. De Gregorio and Guidotti (1995) found an inverse relationship between domestic credit and economic growth using panel data in Latin American countries. Similarly, Narayan and Narayan (2013) confirmed that the growth of bank credit may cast a shadow over economic upswing when using the GMM estimation for data from 65 countries between 1995 - 2011. Akpansung and Babalola (2011) concluded a positive relationship between credit and economic growth using data from 1970 to 2008 in Nigeria with a Two-Stage least squares (2SLS) model. Pramono et al. (2015) analyzed the impact of capital regulation in Indonesia on the growth of bank lending using dynamic panel data analysis with the GMM (generalization method of moments) system approach. The result showed the change of capital regulation has negative and significant impacts in influencing credit growth. Moreover, Christaria and Kurnia (2016) examined the impact of financial ratios, operational efficiency and non-performing loan towards commercial bank profitability. The study found that non-performing loan has a significant impact on return on assets. Similarly, Firmansyah (2014) found that GDP and inflation are negatively related to non-performing loan and loan loss provision. Likewise, Saba et al. (2012) also showed negative relationship between GDP and loan loss provision in the context of US banking sector. Similarly, Pasiouras and Kosmidou (2007) examined the profitability of 584 commercial domestic and foreign banks operating in 15 European Union countries over the period 1995-2001. The study revealed that profitability of both domestic and foreign banks in the European Union is affected by the bank's specific characteristics (size and capital adequacy), and macroeconomic conditions (inflation and the real gross domestic product growth). Hamza (2017) showed that bank size, equity to assets ratio and loan to assets ratio (LAR) have a positive effect on return on assets.

In the context of Nepal, Timsina (2017) analyzed the determinants of bank lending in Nepal for the period 1975 –2014. The study found that gross domestic product and liquidity ratio of banks have significant impact on the lending behaviour. Similarly, Dhungana and Pradhan (2017) examined the effect of commercial bank lending on inflation in Nepal. The study revealed that bank lending has a positive relationship with the inflation in Nepal. Moreover, Singh et al. (2021) investigated the effect of non-performing loan on the profitability of Nepalese commercial banks. The study showed that non-performing loans has a negative impact on bank profitability. Moreover, Bhattarai (2020) analyzed the determinants of commercial banks' lending in Nepal. The study found that macroeconomic variables such as gross domestic products growth rate and inflation rate have insignificant effect on the changes in the total loan and advance. Moreover, Shrestha (2020) investigated the determinants of financial performance of Nepalese commercial banks. The study revealed that management efficiency, asset quality and operational efficiency have significant positive impact on the financial performance of Nepalese commercial banks. Similarly, credit risk has negative impact on the financial performance of Nepalese commercial banks. Hakuduwal (2021) assessed the impact of bank specific factors on the profitability of Nepalese commercial banks. The study found that the total assets and total loan and advance have positive and significant impact on the

profitability of Nepalese commercial banks. The study also revealed that the total equity has insignificant impact and deposit has negative significant impact on the profitability of Nepalese commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of macro-economic and bank specific factors on credit growth of 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 main purpose of the study is to analyse the impact of macro-economic and bank specific factors on credit growth of Nepalese commercial banks. Specifically, it examines the relationship of gross domestic product, inflation rate, money supply, capital adequacy ratio, non-performing loan and bank size with total loan and advances and loan growth 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 17 commercial banks out of 27 commercial banks on the basis of market capitalization for the period from 2014/15 to 2020/21, leading to a total of 119 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|----------------------------|---------------------------------------|-------------------|--------------|
| <b>Public Banks</b>        |                                       |                   |              |
| 1                          | Nepal Bank Limited                    | 2014/15 - 2020/21 | 7            |
| 2                          | Agricultural Development Bank Limited | 2014/15 - 2020/21 | 7            |
| <b>Joint Venture Banks</b> |                                       |                   |              |
| 3                          | Nabil Bank Limited                    | 2014/15 - 2020/21 | 7            |
| 4                          | Everest Bank Limited                  | 2014/15 - 2020/21 | 7            |
| 5                          | Nepal Standard Chartered Bank Limited | 2014/15 - 2020/21 | 7            |
| 6                          | Nepal SBI Bank Limited                |                   |              |
| <b>Private Banks</b>       |                                       |                   |              |
| 7                          | Bank of Kathmandu Limited             | 2014/15 - 2020/21 | 7            |
| 8                          | NMB Bank Limited                      | 2014/15 - 2020/21 | 7            |
| 9                          | Sunrise Bank Limited                  | 2014/15 - 2020/21 | 7            |
| 10                         | Nepal Investment Bank Limited         | 2014/15 - 2020/21 | 7            |
| 11                         | Siddhartha Bank Limited               | 2014/15 - 2020/21 | 7            |
| 12                         | Mega Bank Nepal Limited               | 2014/15 - 2020/21 | 7            |
| 13                         | Prime Commercial Bank Limited         | 2014/15 - 2020/21 | 7            |

|                                     |                                     |                   |            |
|-------------------------------------|-------------------------------------|-------------------|------------|
| 14                                  | Kumari Bank Limited                 | 2014/15 - 2020/21 | 7          |
| 15                                  | Sanima Bank Limited                 | 2014/15 - 2020/21 | 7          |
| 16                                  | Citizens Bank International Limited | 2014/15 - 2020/21 | 7          |
| 17                                  | Machhapuchchhre Bank Limited        | 2014/15 - 2020/21 | 7          |
| <b>Total number of observations</b> |                                     |                   | <b>119</b> |

Thus, the study is based on the 119 observations.

## The model

The model used in this study assumes that the credit growth depends upon macro-economic and banking factors. The dependent variables selected for the study are total loan and advances and loan growth. Similarly, the selected independent variables are gross domestic product, inflation, money supply, capital adequacy ratio, non-performing loan and bank size. Therefore, the model takes the following form:

Credit growth = f (GDP, INF, MS, BS, CAR, and NPL)

More specifically, the given model has been segmented into the following models:

$$LG = \beta_0 + \beta_1 \text{GDP} + \beta_2 \text{INF} + \beta_3 \text{MS} + \beta_4 \text{BS} + \beta_5 \text{CAR} + \beta_6 \text{NPL} + e_{it}$$

$$\text{TLA} = \beta_0 + \beta_1 \text{GDP} + \beta_2 \text{INF} + \beta_3 \text{MS} + \beta_4 \text{BS} + \beta_5 \text{CAR} + \beta_6 \text{NPL} + e_{it}$$

Where,

LG = Loan growth as measured by the annual percentage change in total outstanding loans of individual banks, in percentage.

TLA = Total loan and advances measured by loan and advances disbursed by bank in particular year, Rs in million.

GDP = Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion.

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

MS = Money supply as measured by the ratio of broad money supply to GDP, in percentage.

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

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

BS = Bank size as measured by the total deposits of individual commercial bank, Rs in billion.

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

## Gross domestic product

Gross domestic product is the final market value of goods and services produced within an economy in a specific period of time. Thaker et al. (2013) examined the impact of macroeconomic variables on bank credit in Malaysia between 1991 and 2011. The study showed that gross domestic product is positively associated with credit growth. Moreover, Awdeh (2016) analysed the determinants of credit growth in Lebanon. The study concluded that deposit growth, gross domestic product growth, inflation, and money supply have positive effect on bank credit to the private sector. Likewise, Jelilov et al. (2016) examined the interest rate behaviour and its relationship with economic growth in Nigeria using an error correction model approach. The study showed a strong and positive relationship between the gross domestic prod-

uct and the lending behaviour of the banks in Latvia. Similarly, Zandi et al. (2019) found that there is a positive relationship between GDP and lending behaviour. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a positive relationship between gross domestic product and credit growth.

## **Inflation rate**

Inflation refers to the general rise in price level of goods and services. Caglayan and Xu (2016) analysed inflation volatility effects on the allocation of bank loans. The study revealed that inflation has negative and significant impact on credit growth. Similarly, Colin and Kacaribu (2021) investigated the impact of macroeconomic volatility on bank credit allocation. The study found a negative relationship between inflation volatility and bank lending. Moreover, Boyd et al. (2001) examined the impact of inflation on financial sector performance. The study showed that inflation has a negative relationship with bank lending. Similarly, Somoye and Ilo (2009) assessed the impact of macroeconomic instability on the banking sector lending behavior in Nigeria. The study found that inflation rate has negative relationship with bank lending. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a negative relationship between inflation rate and credit growth.

## **Money supply**

The total volume of currency held by the public at a particular point of time within a country is known as money supply. Boswell et al. (2012) showed that the central bank will buy in the government bonds to stimulate expenditures during the recession and it will increase the supply of money in the market. This showed that excessive money supply leads to higher inflation and decrease in bank lending rate. However, Sengonul and Thorbecke (2005) examined the effect of monetary policy on bank lending in Turkey. The study showed that money supply has a positive relationship with bank loans. Similarly, Onaolapo and Habeeb (2017) revealed that money supply has a positive influence on commercial bank loans and advances. Likewise, Akinbobola (2012) stated that money supply is positively related to bank loans. Based on it, this study develops the following hypothesis.

H<sub>3</sub>: There is a positive relationship between money supply and credit growth.

## **Capital adequacy ratio**

Noss and Toffano (2014) investigated the impact of changes in bank capital requirements on the bank lending. The study showed that bank capital requirement has negative effect on bank lending capacity. Gambacorta and Mistrulli (2004) analysed the impact of bank capital on the lending behaviour. The study showed that bank capital requirement negatively influences the bank loans. Similarly, Aktas and Tas (2007) revealed that capital adequacy ratio has a negative relationship with bank lending and loan growth. Likewise, Arintoko (2021) found that bank capital requirement negatively affects bank lending capacity in long run. Based on it, this study develops the following hypothesis.

H<sub>4</sub>: There is a negative relationship between capital adequacy ratio and credit growth.



## Non-performing loan

Non-performing loan means borrower failing to make schedule payment of principal or interest for a certain period of time. It is the major challenge for banking sector because it decreases the profit of banks and prevent banks from lending to businesses and consumers which results in sluggish economic growth (Vithessonthi, 2016). Serrano (2021) investigated the impact of non-performing loans on bank lending in Europe. The study showed that higher rates of non-performing loans is associated with lower growth rates of performing loans. Messai and Jouini (2013) examined the determinants of non-performing loans in Spanish, Italian and Greek banks. The study found that non-performing loan increases when the unemployment rate and the real interest rate rise and decrease when the GDP growth rate and profitability of banks assets fall. Similarly, Cucinelli (2015) showed that credit risk and non-performing loan have negative impact on bank lending behaviour. Based on it, this study develops the following hypothesis.

H<sub>5</sub>: There is a negative relationship between nonperforming loan and credit growth.

## Bank size

Bank with higher asset has the capacity to lend more and able to manage portfolio. Large bank has a capacity to lend more comparing to small bank. Shikumo and Mirie (2020) examined determinants of lending to small and medium enterprises by commercial banks in Kenya. The study found that there is a positive relationship between bank size and bank lending capacity. Similarly, Chernykh and Theodossiou (2011) examined the determinants of bank long-term lending to businesses in the emerging market in Russia. The study revealed that bank size is the most important and consistent factors in determining a bank's propensity to lend to businesses. Likewise, Ladime et al.(2013) found that bank size and capital structure have statistically significant and positive relationship with bank lending behaviour. Based on it, this study develops the following hypothesis.

H<sub>6</sub>: There is a positive relationship between bank size and credit growth.

## 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 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 17 Nepalese commercial banks for the study period from 2014/15 to 2020/21. The dependent variables are LG (Loan growth as measured by the annual percentage change in total outstanding loans of individual banks, in percentage) and TAL (Total loan and advances measured by loan and advances disbursed by bank in particular year, Rs in million). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), MS (Money supply as measured by the ratio of broad money supply to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by ratio of non-performing loan to total loans, in percentage) and BS (Bank size as measured by the total deposits of individual commercial bank, Rs in billion).

| Variables  | Minimum  | Maximum   | Mean     | Std. Deviation |
|------------|----------|-----------|----------|----------------|
| <b>TAL</b> | 17543.00 | 228523.32 | 82479.42 | 42093.53       |
| <b>LG</b>  | 2.13     | 94.29     | 26.88    | 17.20          |
| <b>GDP</b> | 21.41    | 34.27     | 30.06    | 4.89           |
| <b>MS</b>  | 15.50    | 21.80     | 18.57    | 2.12           |
| <b>INF</b> | 3.60     | 9.93      | 5.73     | 2.08           |
| <b>CAR</b> | 7.49     | 22.99     | 14.09    | 2.47           |
| <b>BS</b>  | 10.11    | 13.67     | 11.56    | 0.52           |
| <b>NPL</b> | 0.10     | 5.35      | 1.36     | 1.02           |

## 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 commercial banks for the study period from 2014/15 to 2020/21. The dependent variables are LG (Loan growth as measured by the annual percentage change in total outstanding loans of individual banks, in percentage) and TAL (Total loan and advances measured by loan and advances disbursed by bank in particular year, Rs in million). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), MS (Money supply as measured by the ratio of broad money supply to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by ratio of non-performing loan to total loans, in percentage) and BS (Bank size as measured by the total deposits of individual commercial bank, Rs in billion).

| Variables | TAL      | LG      | GDP      | MS     | INF      | CAR    | BS    | NPL |
|-----------|----------|---------|----------|--------|----------|--------|-------|-----|
| TAL       | 1        |         |          |        |          |        |       |     |
| LG        | 0.193*   | 1       |          |        |          |        |       |     |
| GDP       | 0.671**  | -0.016  | 1        |        |          |        |       |     |
| MS        | 0.269**  | 0.357** | -0.146   | 1      |          |        |       |     |
| INF       | -0.498** | 0.072   | -0.729** | 0.146  | 1        |        |       |     |
| CAR       | 0.142    | -0.113  | 0.357**  | -0.142 | -0.335** | 1      |       |     |
| BS        | 0.815**  | -0.009  | 0.650**  | -0.003 | -0.451** | 0.198* | 1     |     |
| NPL       | 0.039    | -0.023  | -0.182*  | 0.042  | 0.121    | 0.068  | 0.049 | 1   |

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

Table 3 shows that gross domestic product is positively correlated to total loan and advances. It means that increase in gross domestic product leads to increase in total loan and advances. Similarly, there is positive

relationship between money supply and total loan and advances. It means that increase in money supply leads to increase in total loan and advances. However, there is negative relationship between inflation and total loan and advances. It means that increase in inflation leads to decrease in total loan and advances. Moreover, capital adequacy ratio has positive relationship with total loan and advances. It means increase in capital adequacy ratio leads to increase in total loan and advances. Furthermore, there is positive relationship between non-performing loan and total loan and advances. It means increase in non-performing loan leads to increase in total loan and advances. In addition, there is positive relationship between bank size and total loan and advances. It means increase in bank size leads to increase in total loan and advances.

Similarly, there is a negative relationship between gross domestic product and loan growth. It means increase in gross domestic product leads to decrease in loan growth. Likewise, there is positive relationship between money supply and loan growth. It means increase in money supply leads to increase in loan growth. Moreover, there is positive relationship between inflation and loan growth. It means increase in inflation leads to increase in loan growth. Furthermore, there is negative relationship between capital adequacy ratio and loan growth. It means increase in capital adequacy ratio leads to decrease in loan growth. Similarly, there is negative relationship between bank size and loan growth. It means increase in bank size leads to decrease in loan growth. In addition, there is negative relationship between non-performing loan and loan growth. It means increase in non-performing loan leads to decrease in loan growth.

## **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 gross domestic product, money supply, inflation rate, capital adequacy ratio, non-performing loan and bank size with total loan and advances of Nepalese commercial banks.

**Table 4:** Estimated regression results of gross domestic product money supply, inflation, capital adequacy ratio, non-performing loan and bank size with total loan and advances of Nepalese commercial banks

The results are based on panel data of 17 commercial banks with 119 observations for the period of 2014/15-2020/21 by using the linear regression model and the model is  $TLA = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 MS + \beta_4 BS + \beta_5 CAR + \beta_6 NPL + \epsilon$  where, the dependent variable is TAL (Total loan and advances measured by loan and advances disbursed by bank in particular year, Rs in million). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), MS (Money supply as measured by the ratio of broad money supply to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by ratio of non-performing loan to total loans, in percentage) and BS (Bank size as measured by the total deposits of individual commercial bank, Rs in billion).

| Model | Intercept                | Regression coefficients of |                       |                         |                      |                         |                     | Adj. R_bar <sup>2</sup> | SEE       | F-value |
|-------|--------------------------|----------------------------|-----------------------|-------------------------|----------------------|-------------------------|---------------------|-------------------------|-----------|---------|
|       |                          | GDP                        | MS                    | INF                     | CAR                  | BS                      | NPL                 |                         |           |         |
| 1     | -91015.354<br>(5.066)**  | 5770.793<br>(9.782)**      |                       |                         |                      |                         |                     | 0.445                   | 31353.47  | 95.687  |
| 2     | -17044.253<br>(0.515)    |                            | 5358.963<br>(3.026)** |                         |                      |                         |                     | 0.065                   | 40710.48  | 9.154   |
| 3     | 140324.14<br>-14.158     |                            |                       | -10092.548<br>(6.204)** |                      |                         |                     | 0.241                   | 36669.561 | 38.49   |
| 4     | 48304.083<br>(2.163)*    |                            |                       |                         | 2424.823<br>(1.553)  |                         |                     | 0.012                   | 41843.76  | 2.413   |
| 5     | -677164.67<br>(13.527)** |                            |                       |                         |                      | 65713.156<br>(15.190)** |                     | 0.661                   | 24520.823 | 230.73  |
| 6     | 80270.635<br>(12.418)**  |                            |                       |                         |                      |                         | 1625.611<br>(0.427) | 0.007                   | 42240.173 | 0.182   |
| 7     | -243687.17<br>(8.377)**  | 6240.59<br>(12.034)**      | 7460.26<br>(6.222)**  |                         |                      |                         |                     | 0.580                   | 27265.988 | 82.618  |
| 8     | -229007.23<br>(5.941)**  | 5923.627<br>(7.871)**      | 7502.009<br>(6.228)** | -1033.943<br>(0.583)    |                      |                         |                     | 0.578                   | 27343.957 | 54.878  |
| 9     | -211053.86<br>(5.119)**  | 6080.86<br>(7.978)**       | 7367.757<br>(6.103)** | -1274.653<br>(0.715)    | -1334.447<br>(1.211) |                         |                     | 0.581                   | 27288.638 | 41.692  |
| 10    | -647395.99<br>(13.098)** | 2451.096<br>(3.889)**      | 6288.47<br>(7.373)**  | -1701.702<br>(1.360)    | -1057.524<br>(1.367) | 48793.854<br>(10.888)** |                     | 0.793                   | 19147.505 | 91.456  |
| 11    | -637039.23<br>(12.866)** | 2720.404<br>(4.197)**      | 6284.159<br>(7.419)** | -1682.482<br>(1.354)    | -1254.224<br>(1.612) | 47093.551<br>(10.292)** | 2902.958<br>(1.601) | 0.796                   | 19016.432 | 77.695  |

**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. Total loan and advance is the dependent variable.

Table 4 shows that the beta coefficients for gross domestic product are positive with total loan and advances. It indicates that gross domestic product has a positive impact on total loan and advances. This finding is consistent with the findings of Jelilov et al. (2016). Similarly, the beta coefficients for money supply are positive with total loan and advances. It indicates that money supply has positive impact on total loan and advances. The finding is similar to the findings of Sengonul and Thorbecke (2005). Moreover, the beta coefficients for capital adequacy ratio are positive with total loan and advances. It indicates that capital

adequacy ratio has positive impact on total loan and advances. The finding is consistent with the findings of Aktas and Tas (2007). Likewise, the beta coefficients for bank size are positive with total loan and advances. It indicates that bank size has positive impact on total loan and advances. The finding is similar to the findings of Chernykh and Theodossiou (2011).

Table 5 shows the estimated regression results of gross domestic product, inflation rate, money supply, capital adequacy ratio, bank size and non-performing loan with loan growth of Nepalese commercial banks.

**Table 5:** Estimated regression results of gross domestic product money supply, inflation, capital adequacy ratio, bank size and nonperforming loan with loan growth

The results are based on panel data of 17 commercial banks with 119 observations for the period of 2014/15-2020/21 by using the linear regression model and the model is  $LG = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 MS + \beta_4 BS + \beta_5 CAR + \beta_6 NPL + e_t$  where, the dependent variable is LG (Loan growth as measured by the annual percentage change in total outstanding loans of individual banks, in percentage). The independent variables are GDP (Gross domestic product as measured by the total goods and services produced within the country in a year, USD in billion), MS (Money supply as measured by the ratio of broad money supply to GDP, in percentage), INF (Inflation rate as measured by the change in consumer price index, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by ratio of non-performing loan to total loans, in percentage) and BS (Bank size as measured by the total deposits of individual commercial bank, Rs in billion).

| Model | Inter-cept           | Regression coefficient of |                    |                  |                    |                   |                   | Adj. R_bar <sup>2</sup> | SEE    | F-value |
|-------|----------------------|---------------------------|--------------------|------------------|--------------------|-------------------|-------------------|-------------------------|--------|---------|
|       |                      | GDP                       | MS                 | INF              | CAR                | BS                | NPL               |                         |        |         |
| 1     | 28.52<br>(2.882)**   | -0.055<br>(0.168)         |                    |                  |                    |                   |                   | 0.008                   | 17.271 | 0.028   |
| 2     | -26.954<br>(2.054)** |                           | 2.899<br>(4.128)** |                  |                    |                   |                   | 0.120                   | 16.134 | 17.043  |
| 3     | 23.468<br>(5.040)**  |                           |                    | 0.595<br>(0.779) |                    |                   |                   | 0.003                   | 17.229 | 0.606   |
| 4     | 37.944<br>(4.142)**  |                           |                    |                  | -0.785<br>(1.226)  |                   |                   | 0.004                   | 17.163 | 1.504   |
| 5     | 30.254<br>(0.858)    |                           |                    |                  |                    | -0.292<br>(0.096) |                   | 0.008                   | 17.272 | 0.009   |
| 6     | 27.405<br>(10.370)** |                           |                    |                  |                    |                   | -0.388<br>(0.249) | 0.008                   | 17.269 | 0.062   |
| 7     | -31.701<br>(1.835)*  | 0.131<br>(0.424)          | 2.943<br>(4.132)** |                  |                    |                   |                   | 0.113                   | 16.195 | 8.552   |
| 8     | -43.259<br>(1.891)*  | 0.38<br>(0.852)           | 2.91<br>(4.071)**  | 0.814<br>(0.773) |                    |                   |                   | 0.110                   | 16.223 | 5.881   |
| 9     | -35.858<br>(1.461)   | 0.445<br>(0.981)          | 2.854<br>(3.972)** | 0.715<br>(0.674) | -0.55<br>(0.839)** |                   |                   | 0.108                   | 16.244 | 4.575   |
| 10    | -17.426<br>(0.414)   | 0.598<br>(1.116)          | 2.902<br>(3.996)** | 0.733<br>(0.688) | -0.562<br>(0.853)  | -2.061<br>(0.540) |                   | 0.103                   | 16.294 | 3.696   |
| 11    | -18.027<br>(0.423)   | 0.583<br>(1.045)          | 2.901<br>(3.978)** | 0.732<br>(0.684) | -0.55<br>(0.822)   | -1.962<br>(0.498) | 0.169<br>(0.108)  | 0.095                   | 16.366 | 3.055   |

## 4. Summary and conclusion

Credit growth plays significant role in the development of the economy by providing credit facilities to boost the productive sector of the economy. A sound, progressive and dynamic banking system is a fundamental requirement for economic developments. A well designed and implemented financial management is expected to contribute positively to the creation of a firm's value.

This study attempts to analyse the impact of macro-economic and bank specific factors on the credit growth of Nepalese commercial banks. The study is based on secondary data of 17 commercial banks with 119 observations for the period from 2014/15 to 2020/21.

The study showed that gross domestic product, money supply, capital adequacy ratio, bank size, and non-performing loan have positive impact on total loan and advances. However, inflation has a negative impact on total loan and advances. Similarly, gross domestic product, capital adequacy ratio, bank size and non-performing loan have negative impact on loan growth. However, money supply and inflation have positive impact on loan growth. The study concluded that bank size followed by gross domestic product and inflation is the most influencing factor that explains the changes in total loan and advances of Nepalese commercial banks. Likewise, the study also concluded that the most dominant factor that determines the loan growth is money supply in the context of Nepalese commercial banks.

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## Abstract

*The study examines the impact of volume of deposits, facilities and profitability on liquidity in the context of Nepalese commercial banks. Current ratio and cash reserve ratio are the selected dependent variables. Similarly, fixed deposit, saving deposit, current deposit, mobile banking, automated teller machine, point of sale, return on equity, and return on assets are the selected independent variables. This study is based on secondary data of 20 commercial banks with 120 observations for the study period from 2013/14 to 2018/19. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of volume of deposits, facilities and profitability on liquidity in the context of Nepalese commercial banks.*

*The study showed fixed deposit has a positive impact on cash reserve ratio and current ratio. It means that increase in fixed deposit leads to increase in cash reserve ratio and current ratio. Similarly, saving deposit has a positive impact on cash reserve ratio and current ratio. It means that increase in saving deposit leads to increase in cash reserve ratio and current ratio. However, current deposit has a negative impact on cash reserve ratio and current ratio. It means that increase in current deposit leads to decrease in cash reserve ratio and current ratio. Moreover, return on equity has a positive impact on cash reserve ratio and current ratio. It means increase in return on equity leads to increase in cash reserve ratio and current ratio. Furthermore, there is positive mobile banking has a positive impact on cash reserve ratio and current ratio. It means increase in mobile banking leads to increase in cash reserve ratio and current ratio. In addition, return on assets has a negative impact on cash reserve ratio and current ratio. It means increase in return on assets leads to decrease in cash reserve ratio. Similarly, ATM has a negative impact on cash reserve ratio and current ratio. It means increase in issuance of number of ATMs leads to decrease in cash reserve ratio and current ratio.*

**Key words:** Return on asset, return on equity, cash reserve ratio, current ratio, mobile banking, saving deposit, current deposit and fixed deposit.

# 1. Introduction

Liquidity ratios measure the ability of a firm to meet its current obligations. A firm should ensure that it does not suffer from lack of liquidity, and also it does not have excess liquidity. The failure of a company to meet its obligations due to lack of sufficient liquidity will result in poor credit worthiness, loss of creditors confidence or even legal tangles resulting in closure of the company. Additionally, a very high degree of liquidity is also bad because idle funds will unnecessarily be tied up in current assets earning nothing. Therefore, it becomes necessary to strike a proper balance between high liquidity and lack of liquidity. Nwaezeaku (2006) stated that liquidity in banking measures the availability of cash and the rate of which current assets are converted into cash to meet ordinary and extra ordinary request. Similarly, Agbada and Osuji (2013) described bank liquidity as the ability of the bank to maintain sufficient funds to pay its maturing obligations.

Ogbuabor et al. (2013) defined liquidity as a measure of the relative amount of assets in cash or which can be quickly converted into cash without any loss in value available to meet short term liabilities. Sufficient liquidity will enable a bank to meet short term obligations like normal customer withdrawals, loan requests and operating expenses (Luckett, 1980). This ability will shield the bank against challenges of loss of business, poor credit worthiness, reputational risk and even insolvency. Banks are prone to technological obsolescence and therefore respond swiftly to variations in both economic and technological environment to not only maintain but also increase their customers. Banking technology has increased transactions which ultimately have direct and indirect impact on banks' liquidity. The use of ATMs, POS and Electronic Funds Transfer cut cost and speed up payments. They enable instant global access to information, products and services therefore customers do banking transactions anywhere anytime (Kondabagil and Kondabagil, 2007).

Abubakar et al. (2015) examined the relationship between electronic banking and liquidity of deposit money banks in Nigeria, using time series data for the period 2006- 2014. The results revealed that mobile banking and point of sale have no significant relationship with liquidity, while there is significant negative relationship between internet banking and liquidity. Similarly, Alali (2019) examined the impact of bank liquidity on the profitability of commercial banks: An applied study on Jordanian commercial banks for the period 2013-2017. The study found that there is significant relationship of bank liquidity (liquidity ratio and legal liquidity ratio) with the return on equity of the Jordanian commercial banks. Moreover, Malik et al. (2016) examined the trade-off between liquidity and profitability in private sector banks of Pakistan. The empirical results revealed that there is a statistically significant relationship between bank liquidity measures and return on assets. However, when return on equity and return on investment were used as proxy for profitability, then the relationship became statistically insignificant.

Shahchera (2012) analyzed the impact of liquid asset holdings on bank profitability for a sample of Iranian banks. Using the Generalized Method of Moment (GMM), the study found a non-linear relationship between profitability and liquid asset holdings. Oluwasegun and Samuel (2015) found a positive relationship between liquidity and bank performance for a panel of 13 banks for the period of 2004 to 2012. Similarly, Ismail (2016) found that liquidity (current ratio and the cash conversion cycle) has significant positive relationship with profitability (ROA) of the 64 Pakistani non-financial firms for the period of 2006-2011. Furthermore, Ahmad (2016) showed that there is a positive relationship between liquidity and profitability. Olagunju et al. (2011) noted that increase in cash ratio and the liquidity coverage ratio results in decrease in return on assets of the banks in Nigeria. Wagner (2007) revealed that higher liquidity of companies'

assets leads to increase in instability and the externalities associated with banking failures. Similarly, Kaguri (2013) revealed that liquidity is negatively related to financial stability of life insurance companies. Olagunju et al. (2012) observed that liquidity has a positive influence on profitability of a commercial banks in Nigeria. Similarly, Umobong (2015) demonstrated that there is a positive relationship between liquidity and profitability for a pharmaceutical firm in Nigeria. Moreover, Ajanthan (2013) suggested that liquidity is positively associated with profitability of 8 quoted companies in Sri Lanka over the 5 years.

Shafana (2015) found that liquidity has a significant and negative relationship with the profitability of financial institutions in Sri Lanka for the period from 2009 to 2013 which covered 16 banks and finance firms quoted in the Colombo Stock Exchange. Moreover, Akter and Mahmud (2014) found a strong negative relationship between liquidity and profitability of some Pakistani firms listed on Karachi stock exchange. Similarly, Bolek and Wilinski (2012) examined the influence of liquidity on profitability of Polish construction sector companies. The study found that liquidity has a negative impact on the profitability of construction companies listed on Warsaw Stock Exchange. Eljelly (2004) used correlation and regression on a sample of 929 joint stock companies in order to examine the link between liquidity and profitability. The study found that there is a significant negative relation between liquidity measured by current ratio and profitability. Moreover, Imbierowicz and Rauch (2014) found that liquidity risk has a negative relationship with firm stability indicating that higher the liquidity risk lower would be the financial stability. Likewise, Muharam (2012) stated that liquidity risk has a negative relationship with financial stability of the company. Furthermore, Saleem and Rehman (2011) revealed that there is a close relationship between liquidity and profitability. When liquidity increases, profitability will decrease and vice versa for the 26 oil and gas companies in Pakistan over the 5 years. Likewise, Dahiyat (2016) empirically examined the impact of liquidity and solvency on banks profitability in all banks quoted in Amman exchange for the period 2012-2014. The study found that profitability is negatively related to liquidity.

In the context of Nepal, Bariya et al. (2016) assessed the relationship between liquidity and stability of Nepalese commercial banks. The result showed that return on assets is positively correlated to liquidity management and financial leverage. Humagain et al. (2022) analyzed the impact of internal and external factors on the profitability of Nepalese commercial banks. The study showed that interest rate, GDP growth rate, equity to total assets, total loan to total assets, and bank size have positive impact on return on equity. However, GDP growth rate, equity to total assets, total loan to total assets, and bank size have positive impact on return on assets. Singh and Pandey (2008) found that liquidity, firm size and inflation are positively related to firm's performance. Timilsina (2020) revealed that liquidity and bank size are the major factor affecting the stability of Nepalese commercial banks. Similarly, Pradhan (2014) showed that gross domestic product and market share are positively related to bank profitability, whereas inflation and liquidity are negatively related to bank profitability.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of volume of deposit, facilities and profitability on the liquidity of 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 main purpose of the study is to examine the impact of volume of deposit, facilities and profitability on the liquidity of Nepalese commercial banks. Specifically, it examines the relationship of fixed deposit, saving deposit, current deposit, mobile banking, automated teller machine, point of sale, return on equity and return on assets with cash reserve ratio and current ratio 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered for 20 commercial banks in Nepal with 120 observations for the period of 2013/14 to 2018/19. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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                                   | Century Commercial Bank Limited       | 2013/14-2018/19 | 6            |
| 2                                   | Bank of Kathmandu Limited             | 2013/14-2018/19 | 6            |
| 3                                   | NMB Bank Limited                      | 2013/14-2018/19 | 6            |
| 4                                   | Prabhu Bank Limited                   | 2013/14-2018/19 | 6            |
| 5                                   | Civil Bank Limited                    | 2013/14-2018/19 | 6            |
| 6                                   | Nepal Investment Bank Limited         | 2013/14-2018/19 | 6            |
| 7                                   | Nepal SBI Bank Limited                | 2013/14-2018/19 | 6            |
| 8                                   | Himalayan Bank Limited                | 2013/14-2018/19 | 6            |
| 9                                   | Kumari Bank Limited                   | 2013/14-2018/19 | 6            |
| 10                                  | Laxmi Bank Limited                    | 2013/14-2018/19 | 6            |
| 11                                  | Machhapuchchhre Bank Limited          | 2013/14-2018/19 | 6            |
| 12                                  | Mega Bank Nepal Limited               | 2013/14-2018/19 | 6            |
| 13                                  | Nabil Bank Limited                    | 2013/14-2018/19 | 6            |
| 14                                  | Nepal Bangladesh Bank Limited         | 2013/14-2018/19 | 6            |
| 15                                  | Nepal Bank Limited                    | 2013/14-2018/19 | 6            |
| 16                                  | Sanima Bank Limited                   | 2013/14-2018/19 | 6            |
| 17                                  | Siddhartha Bank Limited               | 2013/14-2018/19 | 6            |
| 18                                  | Standard Chartered Bank Nepal Limited | 2013/14-2018/19 | 6            |
| 19                                  | Sunrise Bank Limited                  | 2013/14-2018/19 | 6            |
| 20                                  | Prime Commercial Bank Limited         | 2013/14-2018/19 | 6            |
| <b>Total number of observations</b> |                                       |                 | <b>120</b>   |

Thus, the study is based on the 120 observations.

## The model

The model estimated in this study assumes that bank liquidity depends on volume of deposit, facilities and profitability. The dependent variables are cash reserve ratio and current ratio. The selected independent

variables are fixed deposit, saving deposit, current deposit, mobile banking, automated teller machine, point of sale, return on equity and return on assets. Therefore, the following model equation is designed to test the hypothesis.

Bank Liquidity =  $f$  (FD, SD, CD, MB, ATM, POS, ROA and ROE).

Where,

CRR = Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage.

CR = Current ratio as measured by the ratio of current ratio to current liabilities, in percentage.

FD = Fixed deposit of the banks, Rs in millions.

SD = Saving deposit of the banks, Rs in millions.

CD = Current deposit of the banks, Rs in millions.

MB = Mobile banking

ATM = Automated teller machine

POS = Point of sale

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 shareholder equity, in percentage.

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

## Return on assets

Jalale and Ali (2017) revealed that bank performance of commercial banks has a positive association with current ratio. Moreover, Rahmadany (2018) concluded that there is a positive relationship between current ratio with return on assets. Likewise, Masood et al. (2016) concluded that current ratio has a positive relationship with return on assets. Furthermore, Khan and Ali (2016) examined the impact of liquidity on the profitability of commercial banks in Pakistan. The study concluded that current ratio has a positive relation with return on assets. Likewise, Durrah (2016) indicated that there is a weak positive relationship between the current ratio and return on assets. Based on it, the study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship of return on assets with bank liquidity.

## Return on equity

Anggita (2021) revealed that the loan to deposit ratio, inflation and net profit margin have positive effect on profitability. In addition, Rajindra et al. (2021) concluded that loan to deposit ratio has a significant positive effect on return on assets. Moreover, Hadian and Phety (2021) indicated that loan to deposit ratio has a positive relationship with the financial performance of Turkish banks. Jovita et al. (2015) showed that loan to deposit ratio has a significant influence on return on assets. Likewise, Hapsari (2018) concluded that there is a positive effect of loan to deposit ratio on the financial performance. Moreover, Rahayu and Nitinegeri (2018) indicated that there is a positive relationship between loan to deposit ratio and profitability. Based on it, the study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship of return on equity with bank liquidity.

## Fixed deposit

Alzorqan (2014) examined the bank liquidity risk and performance of the banking system in Jordan. The study found a positive association between fixed deposits and bank liquidity. Similarly, Mohamad et al. (2013) assessed the determinants of liquidity of Islamic banks of Malaysia. The study revealed that fixed deposits and saving deposits have positive relationship with liquidity position of Islamic banks. Moreover, Diamond and Dybvig (1983) showed a positive association between fixed deposits and liquidity ratio. Furthermore, Kumar and Yadav (2013) found that increase in fixed deposits help in maintaining the liquidity position of the banks. Based on it, the study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of fixed deposits with bank liquidity.

## Current deposit

Fungacova et al. (2017) examined the bank capital, liquidity creation and deposit insurance. The study found a positive relationship between bank capital, liquidity and deposits maintained within the bank. Likewise, DeYoung and Jang (2016) found a positive relationship between liquidity and bank deposits. Moreover, Edem (2017) analyzed the association between liquidity management and performance of deposit money banks in Nigeria for the study period of 1986–2011. The study found a positive relationship between liquidity, return on assets, net interest margin and deposits. In addition, Gatev et al. (2009) revealed a positive relationship between liquidity, deposit to loan ratio and current deposits. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship of current deposits with bank liquidity.

## Saving deposit

El-Chaarani (2019) examined the determinants of bank liquidity in the Middle East region. The study also compared the liquidity levels of banking sectors between Middle Eastern countries. The study revealed the significant impacts of economic growth, assets quality, capital level and bank size on liquidity in the banking sector. The study also showed a positive impact of saving deposits on liquidity of the banks. In addition, Chagwiza (2014) analyzed the determinants of liquidity of Zimbabwe commercial banks. The study found that there is a positive link between bank liquidity and capital adequacy, total assets, saving deposits, gross domestic product and bank rate. The study also found that the adoption of multi-currency, inflation rate and business cycle have a negative impact on liquidity. Furthermore, Hsieh and Lee (2020) showed that Bank liquidity creation is statistically significant and positively related to real economic output, illiquid assets and core deposits. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of saving deposits with bank liquidity.

## Automated Teller Machine (ATM)

Abdullah and Jahan (2014) examined the impact of ATM and mobile banking on the performance of commercial banks in Bangladesh. The study found that there is a significant positive association between ATM banking, mobile banking and bank performance. Similarly, Malhotra and Singh (2009) examined the impact of E-banking on performance of Indian banks during 2007. The study found that the performance and offering of internet banking have significant positive association.



Vekya (2017) examined impact of electronic banking on the performance of commercial banks in Kenya. The study showed that there is a positive significant relationship between ATM transactions and bank performance. Further, Akhisar et al. (2015) examined the effect of electronic banking on liquidity of commercial banks. The study showed that ATM banking has significant positive effect on liquidity. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship of ATM with bank liquidity.

## Mobile banking

Ayo et al. (2010) asserted that mobile banking helps banks to increase speed, shorten processing periods, improve the flexibility of business transactions and reduce cost associated with having personnel serve customers physically. Mobile e-banking also offers tremendous profit potential by providing mobile financial services to attract the mobile consumers. In fact, it is apparent that many banks are motivated to implement e-banking by forces relating to the maximization of the earning through increased market scope and improved customer relationship due to product delivery convenience and service customization (Simpson, 2002). Abubakar et al. (2015) examined the relationship between electronic banking and liquidity of deposit money banks in Nigeria, using time series data for the period 2006- 2014. The result showed that mobile banking and point of sale have significant positive relationship with liquidity, while there is significant negative relationship between internet banking and liquidity. Hassan et al. (2013) studied electronic banking products and performance of Nigerian deposit money banks. The study found that the adoption of electronic banking products has strongly and significantly influenced the performance of Nigerian banks measured by net profit margin and liquidity. Based on it, this study develops the following hypothesis:

H<sub>7</sub>: There is a positive relationship of mobile banking with bank liquidity.

## Point of sale

Ugwueze and Nwezeaku (2016) examined the relationship between electronic banking and the performance of Nigerian commercial banks. Electronic banking was proxied by value of Point-of-Sale transactions while commercial banking performance was proxied by customers' deposits and liquidity. The results showed that POS is cointegrated with both the savings and time deposits and liquidity. Similarly, Orji (2018) analyzed the impact of e-banking innovations (ATM transactions, mobile banking transactions, and point of sales transactions) on the performance of six selected banks in Nigeria. The results indicated that automated teller machine transactions, point of sale transactions, mobile banking transactions are major e-banking innovations that contribute to old and new banks' deposits, liquidity and profits in Nigeria. Moreover, Aduda and Kingoo (2012) investigated the relationship between e-banking and performance of Kenya banking system. The study revealed that e-banking has strong and significance marginal effects on returns on asset, deposit collection, liquidity and net profit in the Kenyan banking industry. Thus, there exists positive relationship between e-banking and bank performance. Based on it, this study develops the following hypothesis:

H<sub>8</sub>: There is a positive relationship of point of sale with bank liquidity.

### 3. Results and discussion

#### Descriptive statistics

**Table 2** presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2018/19.

This table shows the descriptive statistics of dependent and independent variables of 20 Nepalese commercial banks for the study period of 2013/14 to 2018/19. Dependent variables are CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage) and CR (Current ratio as measured by the ratio of current ratio to current liabilities, in percentage). The selected independent variables of the study are FD (Fixed deposit of the banks, Rs in millions), SD (Saving deposit of the banks, Rs in millions), CD (Current deposit of the banks, Rs in millions), 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 shareholder equity, in percentage), MB (Mobile banking), ATM (Automated teller machine) and POS (Point of sale).

| Variable | Minimum | Maximum  | Mean     | Std. Deviation |
|----------|---------|----------|----------|----------------|
| FD       | 3075.23 | 69095.66 | 24903.90 | 14633.34       |
| SD       | 818.59  | 61961.03 | 21840.34 | 13871.40       |
| CD       | 181.50  | 53437.51 | 7466.72  | 9550.20        |
| CRR      | 4.06    | 24.03    | 10.92    | 4.34           |
| CR       | 0.61    | 3.60     | 1.64     | 0.65           |
| ROA      | -1.37   | 8.27     | 1.72     | 0.90           |
| ROE      | -25.24  | 131.85   | 17.05    | 16.28          |
| MB       | 1403650 | 13929970 | 5858279  | 3771907        |
| ATM      | 667441  | 9674552  | 6043958  | 1520238        |
| POS      | 412371  | 1304502  | 838119   | 214248         |

#### 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 20 Nepalese commercial banks for the study period of 2013/14 to 2018/19. Dependent variables are CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage) and CR (Current ratio as measured by the ratio of current ratio to current liabilities, in percentage). The selected independent variables of the study are FD (Fixed deposit of the banks, Rs in millions), SD (Saving deposit of the banks, Rs in millions), CD (Current deposit of the banks, Rs in millions), 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 shareholder equity, in percentage), MB (Mobile banking), ATM (Automated teller machine) and POS (Point of sale).

| Variables | FD      | SD      | CD      | CRR     | CR     | ROA     | ROE    | MB      | ATM     | t |
|-----------|---------|---------|---------|---------|--------|---------|--------|---------|---------|---|
| FD        | 1       |         |         |         |        |         |        |         |         |   |
| SD        | 0.328** | 1       |         |         |        |         |        |         |         |   |
| CD        | 0.320** | 0.355** | 1       |         |        |         |        |         |         |   |
| CRR       | 0.390** | 0.113   | -0.090  | 1       |        |         |        |         |         |   |
| CR        | 0.394** | 0.018   | -0.093  | 1.000** | 1      |         |        |         |         |   |
| ROA       | 0.222*  | 0.284** | 0.407** | -0.002  | -0.002 | 1       |        |         |         |   |
| ROE       | -0.033  | 0.216*  | 0.133   | 0.161   | 0.162  | 0.332** | 1      |         |         |   |
| MB        | -0.107  | 0.068   | -0.081  | 0.032   | 0.032  | 0.020   | -0.023 | 1       |         |   |
| ATM       | -0.109  | 0.033   | -0.135  | -0.074  | -0.074 | 0.018   | -0.020 | 0.848** | 1       |   |
| POS       | -0.086  | 0.110   | -0.079  | -0.032  | -0.032 | 0.067   | -0.040 | 0.871** | 0.895** | 1 |

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

Table 3 shows that fixed deposit is positively correlated to cash reserve ratio. It means that increase in fixed deposit leads to increase in cash reserve ratio. Similarly, there is positive relationship between saving deposit and cash reserve ratio. It means that increase in saving deposit leads to increase in cash reserve ratio. However, there is negative relationship between current deposit and cash reserve ratio. It means that increase in current deposit leads to decrease in cash reserve ratio. Moreover, return on equity has a positive relationship with cash reserve ratio. It means increase in return on equity leads to increase in cash reserve ratio. Furthermore, there is positive relationship between mobile banking and cash reserve ratio. It means increase in mobile banking leads to increase in cash reserve ratio. In addition, there is negative relationship between return on assets and cash reserve ratio. It means increase in return on assets leads to decrease in cash reserve ratio. Similarly, there is negative relationship between ATM and cash reserve ratio. It means increase in issuance of number of ATM leads to decrease in cash reserve ratio.

Similarly, fixed deposit is positively correlated to current ratio. It means that increase in fixed deposit leads to increase in current ratio. Similarly, there is positive relationship between saving deposit and current ratio. It means that increase in saving deposit leads to increase in current ratio. However, there is negative relationship between current deposit and current ratio. It means that increase in current deposit leads to decrease in current ratio. Moreover, return on equity has a positive relationship with current ratio. It means increase in return on equity leads to increase in current ratio. Furthermore, there is positive relationship between mobile banking and current ratio. It means increase in mobile banking leads to increase in current ratio. In addition, there is negative relationship between return on assets and current ratio. It means increase in return on assets leads to decrease in current ratio. Similarly, there is negative relationship between ATM and current ratio. It means increase in issuance of number of ATM leads to decrease in current 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 fixed deposit, saving deposit, current deposit, mobile banking, ATM, POS, return on assets and return on equity with cash reserve ratio of Nepalese commercial banks.

**Table 4:** Estimated regression results of fixed deposit, saving deposit, current deposit, mobile banking, ATM, POS, return of equity, and return on assets on cash reserve ratio

The results are based on panel data of 20 commercial banks with 120 observations for the period of 2013/14-2018/19 by using the linear regression model and the model is  $CRR = \beta_0 + \beta_1 FD + \beta_2 SD + \beta_3 CD + \beta_4 MB + \beta_5 ATM + \beta_6 POS + \beta_7 ROE + \beta_8 ROA + e$  where, the dependent variable is CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage). The selected independent variables of the study are FD (Fixed deposit of the banks, Rs in millions), SD (Saving deposit of the banks, Rs in millions), CD (Current deposit of the banks, Rs in millions), 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 shareholder equity, in percentage), MB (Mobile banking), ATM (Automated teller machine) and POS (Point of sale).

| Model | Intercept              | Regression coefficients of |                  |                    |                  |                    |                   |                  |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|------------------------|----------------------------|------------------|--------------------|------------------|--------------------|-------------------|------------------|-------------------|-------------------------|-------|---------|
|       |                        | FD                         | SD               | CD                 | MB               | ATM                | POS               | ROE              | ROA               |                         |       |         |
| 1     | 68.14<br>(5.539) **    | 5.553<br>(4.653) **        |                  |                    |                  |                    |                   |                  |                   | 0.148                   | 1.230 | 21.65   |
| 2     | 9.627<br>(1.042)       |                            | 0.127<br>(0.140) |                    |                  |                    |                   |                  |                   | 0.008                   | 4.358 | 0.021   |
| 3     | 19.165<br>(2.291)      |                            |                  | -0.860<br>(0.987)  |                  |                    |                   |                  |                   | 0.014                   | 4.343 | 0.973   |
| 4     | 7.869<br>(0.0908)      |                            |                  |                    | 0.457<br>(0.353) |                    |                   |                  |                   | 0.007                   | 4.319 | 0.124   |
| 5     | 32.644<br>(1.213)      |                            |                  |                    |                  | -3.208<br>(0.807)  |                   |                  |                   | 0.003                   | 4.346 | 0.651   |
| 6     | 17.783<br>(0.902)      |                            |                  |                    |                  |                    | -1.162<br>(0.348) |                  |                   | 0.187                   | 4.007 | 4.3563  |
| 7     | 10.189<br>(117.880) ** |                            |                  |                    |                  |                    |                   | 0.043<br>(1.774) |                   | 0.018                   | 4.301 | 3.146   |
| 8     | 10.94<br>(12.703) **   |                            |                  |                    |                  |                    |                   |                  | -0.011<br>(0.024) | 0.008                   | 4.358 | 0.001   |
| 9     | 59.914<br>(4.472) **   | 6.273<br>(4.856) **        | 1.580<br>(1.730) | -1.541<br>(1.711)  |                  |                    |                   |                  |                   | 0.156                   | 3.984 | 8.353   |
| 10    | 85.215<br>(2.257) *    |                            |                  |                    | 4.91<br>(1.784)  | -15.039<br>(1.617) | -0.878<br>(0.104) |                  |                   | 0.248                   | 3.634 | 1.519   |
| 11    | 10.614<br>(12.08) **   |                            |                  |                    |                  |                    |                   | 0.302<br>(0.648) | -0.049<br>(1.884) | 0.013                   | 4.312 | 1.776   |
| 12    | 150.75<br>(3.884) **   | 6.121<br>(4.688) **        | 1.314<br>(1.392) | -0.563<br>(-0.605) | 4.416<br>(1.752) | -16.172<br>(1.873) | -0.944<br>(0.12)  | 0.223<br>(0.472) | -0.029<br>(1.197) | 0.177                   | 3.663 | 13.002  |

**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.
- Cash reserve ratio is the dependent variable.

Table 4 shows that the beta coefficients for fixed deposit are positive with cash reserve ratio. It indicates that fixed deposit has a positive impact on cash reserve ratio. This finding is consistent with the findings of Diamond and Dybvig (1983). Similarly, the beta coefficients for saving deposit are positive with cash reserve ratio. It indicates that saving deposit has positive impact on cash reserve ratio. The finding is similar to the findings of Chagwiza (2014). Moreover, the beta coefficients for return on equity are positive with

cash reserve ratio. It indicates that return on equity has positive impact on cash reserve ratio. The finding is consistent with the findings of Hadian and Phety (2021). Likewise, the beta coefficients for mobile banking are positive with cash reserve ratio. It indicates that mobile banking has positive impact on cash reserve ratio. The finding is similar to the findings of Abubakar et al. (2015).

Table 5 shows the regression results fixed deposit, saving deposit, current deposit, mobile banking, ATM, POS, return on assets and return on equity with current ratio of Nepalese commercial banks.

**Table 5:** Estimated regression results of fixed deposit, saving deposit, current deposit, mobile banking, ATM, POS, return on equity, and return on assets on current ratio

The results are based on panel data of 20 commercial banks with 120 observations for the period of 2013/14-2018/19 by using the linear regression model and the model is  $CR = \beta_0 + \beta_1 FD + \beta_2 SD + \beta_3 CD + \beta_4 MB + \beta_5 ATM + \beta_6 POS + \beta_7 ROE + \beta_8 ROA + e$  where, the dependent variable is CR (Current ratio as measured by the ratio of current ratio to current liabilities, in percentage). The selected independent variables of the study are FD (Fixed deposit of the banks, Rs in millions), SD (Saving deposit of the banks, Rs in millions), CD (Current deposit of the banks, Rs in millions), 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 shareholder equity, in percentage), MB (Mobile banking), ATM (Automated teller machine) and POS (Point of sale).

| Model | Regression coefficients of |                     |                  |                   |                  |                    |                   |                  |                   | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|----------------------------|---------------------|------------------|-------------------|------------------|--------------------|-------------------|------------------|-------------------|------------------------------------|-------|---------|
|       | Intercept                  | FD                  | SD               | CD                | MB               | ATM                | POS               | ROE              | ROA               |                                    |       |         |
| 1     | 10.212<br>(5.536)          | 0.832<br>(4.650)**  |                  |                   |                  |                    |                   |                  |                   | 0.148                              | 0.600 | 21.622  |
| 2     | 1.442<br>(1.041)           |                     | 0.019<br>(0.412) |                   |                  |                    |                   |                  |                   | 0.008                              | 0.653 | 0.020   |
| 3     | 2.869<br>(2.287)           |                     |                  | -0.128<br>(0.982) |                  |                    |                   |                  |                   | 0.017                              | 0.650 | 0.096   |
| 4     | 1.189<br>(0.915)           |                     |                  |                   | 0.067<br>(0.347) |                    |                   |                  |                   | 0.007                              | 0.653 | 0.120   |
| 5     | 4.907<br>(0.126)           |                     |                  |                   |                  | -0.483<br>(0.810)  |                   |                  |                   | 0.003                              | 0.651 | 0.066   |
| 6     | 2.681<br>(0.908)           |                     |                  |                   |                  |                    | -0.177<br>(0.353) |                  |                   | 0.007                              | 0.653 | 0.150   |
| 7     | 1.528<br>(17.89)           |                     |                  |                   |                  |                    |                   | 0.006<br>(1.779) |                   | 0.018                              | 0.644 | 3.165   |
| 8     | 1.641<br>(12.706)          |                     |                  |                   |                  |                    |                   |                  | -0.001<br>(0.018) | 0.008                              | 0.653 | 0.014   |
| 9     | 8.977<br>(4.468)           | 0.941<br>(4.854)**  | 0.237<br>(1.729) | -0.007<br>(0.05)  |                  |                    |                   |                  |                   | 0.178                              | 0.597 | 8.345   |
| 10    | 12.762<br>(2.254)          |                     |                  |                   | 0.734<br>(1.779) | -2.248<br>(1.612)  | -0.134<br>(0.106) |                  |                   | 0.013                              | 0.646 | 1.512   |
| 11    | 1.592<br>(12.212)          |                     |                  |                   |                  |                    |                   | 0.007<br>(1.888) | -0.045<br>(0.644) | 0.013                              | 0.644 | 1.782   |
| 12    | 22.581<br>(22.581)         | 0.918<br>(10.918)** | 0.197<br>(0.197) | -0.084<br>(0.084) | 0.660<br>(0.668) | -2.417<br>(2.417)* | -0.145<br>(0.145) | 0.004<br>(0.004) | -0.034<br>(0.034) | 0.179                              | 0.587 | 4.236   |

**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.
- Current ratio is the dependent variable.

Table 5 shows that the beta coefficients for fixed deposit are positive with current ratio. It indicates that fixed deposit has a positive impact on current ratio. This finding is consistent with the findings of Mohamad et al. (2013). Similarly, the beta coefficients for saving deposit are positive with current ratio. It indicates that saving deposit has positive impact on current ratio. The finding is similar to the findings of El-Chaarani (2019). Moreover, the beta coefficients for return on equity are positive with current ratio. It indicates that return on equity has positive impact on current ratio. The finding is consistent with the findings of Hapsari (2018). Likewise, the beta coefficients for mobile banking are positive with current ratio. It indicates that mobile banking has positive impact on current ratio. The finding is similar to the findings of Ayo et al. (2010).

## 4. Summary and conclusion

One of the most important factors influencing cohesive economic development of any country is effective performance and reliability of its banks. The evaluation of soundness and stability of the commercial banks and the stability of the financial system of a country are closely related. Banks are the most important financial intermediaries in the most economies that provide a bundle of different services. As financial intermediaries, banks play a crucial role in the operation of most economies. The efficiency of financial intermediation can also affect economic growth. Besides, banks insolvencies can result in systemic crisis. Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system. Modern competitive business environment demands efficient use of resources, which underscores the importance of liquidity and profitability risk. The interrelation of the volume of deposits and facilities and profits on liquidity of Nepalese commercial banks is of great importance for banking sector.

This study attempts to analyze the impact of volume of deposit, facilities and profitability on liquidity of Nepalese commercial banks. The study is based on secondary data of 20 commercial banks with 120 observations for the period from 2013/14 to 2018/19.

The study showed fixed deposit, saving deposit, mobile banking and return on equity have positive impact on current ratio and cash reserve ratio. However, current deposit, ATM, POS and return on assets have negative impact on current ratio and cash reserve ratio. The study concluded that volume of deposits plays significant role in maintaining the liquidity position of the bank. Likewise, the study also concluded that the most dominant factor that determines the cash reserve ratio and current ratio is fixed deposit in the context of Nepalese commercial banks.

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## Abstract

*The study examines the effect of banking performance on economic growth of Nepal. Gross domestic product and per capita income are selected as the dependent variables. The selected independent variables are earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return. The study is based on secondary data of 26 commercial banks with 208 observations for the period from 2011/12 to 2018/19. The data were collected from the publications and websites of Nepal Rastra Bank (NRB), Ministry of Finance (MoF), and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of banking performance on the economic growth of Nepal.*

*The study showed that earnings per share has a positive impact on gross domestic product and per capita income. It indicates that increase in earnings per share leads to increase in gross domestic product and per capita income. Likewise, assets size has a positive impact on gross domestic product and per capita income. It indicates that larger the assets size, higher would be the gross domestic product and per capita income. Moreover, the study showed that price earnings ratio has a positive impact on gross domestic product and per capita income. It reveals that higher the price earnings ratio, higher would be the gross domestic product and per capita income. Likewise, the study also showed that return on assets has a positive impact on gross domestic product and per capita income. It indicates that higher the return on assets, higher would be the gross domestic product and per capita income. Similarly, dividend per share has a positive impact on gross domestic product and per capita income. It reveals that higher the dividend per share, higher would be the gross domestic product and per capita income. Likewise, share price has a positive impact on gross domestic product and per capita income. It means that higher the share price, higher would be the gross domestic product and per capita income. Furthermore, share return has a positive impact on gross domestic product and per capita income. It means that higher the share return, higher would be the gross domestic product and per capita income.*

**Keywords:** Gross domestic product, per capita income, earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return.

# 1. Introduction

The financial soundness of a country depends on a robust financial system that comprises a set of financial institutions, efficient financial markets and customer centric financial services. The nature and extent of financial crisis in the financial system depend on understanding the impact and likelihood of systemic risk (Allen et al., 2010). Strong financial institutions are critical for increased investment, economic growth, employment and poverty alleviation. The key component in a financial system is banks which work as intermediate between funds provider and those in need of funds contributing to economic growth. Banks play a significant role in the implementation of a country monetary policy. Thus, profitable banks will ensure the continuity of economic growth as well as the stability of the financial system. Therefore, the banking sector financial services play a vital role in the economic growth and development of a country (Kenourgios and Samitas, 2009).

King and Levine (1993) concluded that financial development is strongly associated with real per capita GDP growth, the rate of physical capital accumulation, and improvements in the efficiency with which economies employ physical capital. Ahmad and Malik (2009) found that financial sector development affects per capita GDP mainly through its role in efficient resource allocation, rather than its effects on capital accumulation. The pursuit of economic growth and sustainable development is one of the core macroeconomic goals of every nation. Economic growth is usually anchored on the financial development of a country. A well-developed financial system enhances investment by identifying and funding good business opportunities, mobilizes savings, enables trading, hedges and diversifies of risks, and facilitates the exchange of goods and services. These functions result in a more efficient allocation of resources, rapid accumulation of physical and human capital, and faster technological progress, which in turn results in economic growth. An efficient financial system is one of the foundations for building sustained economic growth and an open, vibrant economic system. Many countries have experienced successful financial sector reforms which have been accompanied by improvements in economic growth and efficiency of the financial system (Beck, 2006). Ayunku and Apiri (2020) examined the impact of dividend policy on market value of quoted commercial banks. The empirical result revealed that there is a significant dividend policy impact on market value of quoted commercial banks in Nigeria. Moreover, the study also revealed that there is a positive relationship between dividend per share and economic growth.

Hamza and Khan (2014) explored the impact of banking sector's performance on economic growth of Pakistan. The study found a positive and significant association between measures of bank performance and economic growth. Similarly, the study indicated that measures of bank performance namely deposit, advances, profitability, interest earnings and investment have positive relationship with economic growth as measured by GDP. Similarly, Chioma et al. (2015) found there is a negative and insignificant relationship between inflation and bank profitability. Bhatta et al. (2019) analyzed the impact of deposit rate, lending rate, assets quality and liquidity on the financial performance of commercial banks. The study showed that liquidity, GDP and inflation are negatively related to financial performance of Nepalese commercial banks. In addition, Rioja and Valev (2014) claimed that stock market capitalization is a major indicator for economic growth. Beck et al. (2000) stated that the countries with higher levels of private credit to GDP have been shown to grow faster and experience faster rates of poverty reduction. Moreover, Levine et al. (2000) argued that financial sector induces economic growth through reallocation of resources from traditional to growth-inducing sectors and the promotion of entrepreneurship in growth-inducing sectors. Similarly, Kumar (2013) found that credit to deposit ratio helps in the mobilization of deposits and deployments of credit. The study also showed a positive relationship between economic growth, assets growth and credit to small and medium enterprises.

Bailliu (2000) found that capital flows can only enhance economic growth in countries with sufficiently-developed financial sector. Choong et al. (2004) concluded that in the long run, financial sector development is crucial for FDI to have positive effects on economic growth. Dingela and Khobai (2017) revealed that there is a statistically significant positive relationship between money supply and economic growth both in short run and long run. Furthermore, Valickova et al. (2015) indicated a positive and statistically significant effect of finance on economic growth. The study further revealed that stock markets support faster economic growth than other financial intermediaries. Real sector plays an important role in capacity building and employment generation. The real sector performs better in the presence of a developed financial sector. Hence, financial sector development is a catalyst for growth in the real sector (Anyanwu, 2010). Rezina et al. (2017) argued that stock markets play a vital role in the global economy where the financial markets generate finance for economic growth. Levine and Zervos (1998) and Demirguc-Kunt and Maksimovic (1998) found a positive relationship between stock market capitalization and economic growth. Ahmad and Malik (2009) reported that domestic credit to private sector is instrumental in increasing per worker output and hence promote economic growth in the long run. Beck et al. (2000) found a positive association between private sector credit and economic growth. According to Claessens and Feijen (2006), financial intermediaries can reduce the risk of falling into poverty and helps to cope with socio-economic shocks as well as reduce the vulnerability to any untoward situation by providing services like insurance, special loan and saving. Sufian (2009) found that credit-to-deposit ratios and assets growth have a positive impact on the profitability of the banking sector and economic growth of the country.

In the context of Nepal, Mainali et al. (2020) analyzed the impact of economic openness and inflation on the profitability of Nepalese commercial banks during the period of 2012 to 2018. The study found that bank size has a positive impact on return on assets. Similarly, the study reported that inflation has a negative impact on return on assets. Koju et al. (2018) showed that NPL has a significant positive relationship with the export to import ratio, inefficiency, and assets size. Similarly, the study also showed a negative relationship of NPL with the GDP growth rate, capital adequacy, and inflation rate. Bist and Bista (2018) found that financial development has a significant positive impact on economic growth in both the long run and short run. However, gross domestic saving has a negative impact on economic growth of Nepal. Rana (2020) stated that money supply has a positive impact on the economic growth of Nepal in the long-run as well as short-run. Paudel and Acharya (2020) examined the role of financial development and economic growth in Nepal employing Autoregressive distributed lag (ARDL) approach of cointegration using time series data for the period from 1965 to 2018. The study stated that the financial development supports the economic growth. The study also concluded that financial development extends financial activities to boost the economic growth in Nepal. Similarly, financial development helps to expand the economy, raise the income, reduces the poverty, and enhances economic growth. An inefficient financial system costs high, reduces the investment and shrinks the employment and output. In such case, it ultimately retards the economy.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the effect of banking performance on economic growth. 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 banking performance on economic growth of Nepal. Specifically, it examines the relationship of earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return with gross domestic product and per capita income of Nepal.

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

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 26 Nepalese commercial banks from 2011/12 to 2018/19, leading to a total of 208 observations. The main sources of data include publications and websites of Nepal Rastra Bank (NRB), Ministry of Finance (MoF), 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  | 2011/12-2018/19 | 8            |
| 2                                   | Bank of Kathmandu Limited              | 2011/12-2018/19 | 8            |
| 3                                   | Century Commercial Bank Limited        | 2011/12-2018/19 | 8            |
| 4                                   | Citizens Bank International Limited    | 2011/12-2018/19 | 8            |
| 5                                   | Civil Bank Limited                     | 2011/12-2018/19 | 8            |
| 6                                   | Everest Bank Limited                   | 2011/12-2018/19 | 8            |
| 7                                   | Global IME Bank Limited                | 2011/12-2018/19 | 8            |
| 8                                   | Himalayan Bank Limited                 | 2011/12-2018/19 | 8            |
| 9                                   | Kumari Bank Limited                    | 2011/12-2018/19 | 8            |
| 10                                  | Laxmi Bank Limited                     | 2011/12-2018/19 | 8            |
| 11                                  | Machhapuchchhre Bank Limited           | 2011/12-2018/19 | 8            |
| 12                                  | Mega Bank Nepal Limited                | 2011/12-2018/19 | 8            |
| 13                                  | Nabil Bank Limited                     | 2011/12-2018/19 | 8            |
| 14                                  | Nepal Bangladesh Bank Limited          | 2011/12-2018/19 | 8            |
| 15                                  | Nepal Bank Limited                     | 2011/12-2018/19 | 8            |
| 16                                  | Nepal Credit and Commerce Bank Limited | 2011/12-2018/19 | 8            |
| 17                                  | Nepal Investment Bank Limited          | 2011/12-2018/19 | 8            |
| 18                                  | Nepal SBI Bank Limited                 | 2011/12-2018/19 | 8            |
| 19                                  | NIC Asia Bank Limited                  | 2011/12-2018/19 | 8            |
| 20                                  | NMB Bank Limited                       | 2011/12-2018/19 | 8            |
| 21                                  | Prabhu Bank Limited                    | 2011/12-2018/19 | 8            |
| 22                                  | Prime Commercial Bank Limited          | 2011/12-2018/19 | 8            |
| 23                                  | Sanima Bank Limited                    | 2011/12-2018/19 | 8            |
| 24                                  | Siddhartha Bank Limited                | 2011/12-2018/19 | 8            |
| 25                                  | Standard Chartered Bank Nepal Limited  | 2011/12-2018/19 | 8            |
| 26                                  | Sunrise Bank Limited                   | 2011/12-2018/19 | 8            |
| <b>Total number of observations</b> |                                        |                 | <b>208</b>   |

Thus, the study is based on 208 observations.



## The model

The model used in this study assumes that economic growth depends on banking performance. The dependent variables selected for the study are gross domestic product and per capita income. Similarly, the selected independent variables in this study are earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return. The following model equations are designed to test the hypothesis.

$$\begin{aligned}\text{GDPit} &= \beta_0 + \beta_1 \text{EPS}_{it} + \beta_2 \text{DPS}_{it} + \beta_3 \text{PER}_{it} + \beta_4 \text{ROA}_{it} + \beta_5 \text{SP}_{it} + \beta_6 \text{SR}_{it} + \beta_7 \text{AS}_{it} + e_{it} \\ \text{PCIit} &= \beta_0 + \beta_1 \text{EPS}_{it} + \beta_2 \text{DPS}_{it} + \beta_3 \text{PER}_{it} + \beta_4 \text{ROA}_{it} + \beta_5 \text{SP}_{it} + \beta_6 \text{SR}_{it} + \beta_7 \text{AS}_{it} + e_{it}\end{aligned}$$

Where,

- SP = Share price as measured by the share price of the bank determined by the demand and supply forces in the market, in Rupees.
- SR = Stock return as measured by change in price plus dividend by previous year's price, in percentage.
- EPS = Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rupees.
- DPS = Dividend per share as measured by the company's total dividend paid by the total number of shares outstanding, in Rupees.
- PER = Price earnings ratio as measured by the ratio of market value per share to earnings per share, in times.
- ROA = Return on assets as measured by the ratio of net income to total assets, in percentage.
- GDP = Gross domestic product as measured by the annual change in nominal per capita GDP, in US dollar.
- PCI = Per capita income as measured by average income earned per person, in US dollar.

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

## Share price

Masoud (2013) explored the causal link between stock market performance and economic growth. The study argued that stock markets are crucially linked to economic growth. The study also found a positive relationship between efficient stock markets, stock price and economic growth, both in short run and long run. The study showed an indirect transmission mechanism through the effect of stock market development on investment. Similarly, Chami et al. (2006) argued that the stock market is a vital conduit for monetary policy transmission which affects economic activity. Moreover, Shahbaz et. al. (2008) confirmed the long-run positive correlation between stock market and economic growth in Pakistan. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between share price and economic growth.

## Share return

Gokdeniz et al. (2003) examined the impact of financial markets on economic growth using least squares method between 1989-2002 periods in Turkey. The study showed that stock markets and stock return have positive effect on economic growth in Turkey. Basdas and Soytaş (2009) also showed positive association between stock return, interest rates and economic growth in Turkey. Aydemir (2008), using Vector Error

Correction Model and Granger causality test, revealed that there is a long term meaningful and bidirectional relationship between stock returns and economic growth. According to Baker et al. (2005), between 1958–2004 periods, the return on financial assets in the United States was positively correlated to economic growth. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between share return and economic growth.

## Earnings per share

Geetha and Swaaminathan (2015) defined earnings per share as the ratio of the profit after tax of the company for any financial year after the payment of preference dividend. Ritter (2005) examined the relationship between economic growth and equity returns over 1900–2002. The study found a positive relationship between earnings per share and economic growth. Similarly, Gurley and Shaw (1955) investigated the link between stock markets and real economic performance. The study examined the nature of financial systems development in both developed and less developed countries (LDCs). The study concluded that developed countries' financial systems are more innovative, and may themselves contribute to economic growth. The study also concluded a positive association between earnings per share and economic growth. Furthermore, Rousseau and Wachtel (2000) indicated that the stock market has a strong correlation with the growth rate of real GDP per capita. The study discovered that the liquidity of the stock market is a primary stock market variable in justifying economic growth. The study also concluded a positive association between earnings per share, share return and economic growth. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between earnings per share and economic growth.

## Price earnings ratio

Geetha and Swaaminathan (2015) pointed that price earnings ratio enables an investor to make appropriate calculation of the time required to cover the investment in a company's stock. Filer et al. (2000) analyzed the bridge between the stock market and economic growth in 70 countries in the period 1985 to 1997 by applying the Grainger causality test. The study revealed that there is a positive association between market capitalization, price earnings ratio and economic growth. Ovat (2012) analyzed the Nigerian financial market, using indicators such as stock market size, and stock market liquidity. The study concluded that the latter has more impact on growth than market size. The study also showed a positive impact of price earnings ratio on economic growth of the nation. Bentour (2014) demonstrated that market capitalization and price earnings ratio have a significant positive effect on GDP. Wai Mun et al. (2008) showed that the stock market and price earnings ratio have significant positive impact on economic productivity. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between price earnings ratio and economic growth.

## Return on assets

Return on assets depicts the efficiency of company's management in utilizing all resources or assets of the firm to procure earnings. Kosmidou et al. (2007) revealed a positive relationship of growth in GDP with profitability of banks. Similarly, Staikouras and Wood (2004) found that GDP growth rate has a positive

impact on banks' profitability. Moreover, Athanasoglou et al. (2008) showed a positive impact of GDP growth on profitability of banks. In addition, Erina and Lace (2013) found that GDP growth rate has a positive relationship with banks' profitability. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between return on assets and economic growth.

## Asset size

Dahmash et al. (2021) assessed the effect of a firm's internal factors on bank profitability in Jordan. The results showed that there is a significant positive effect of firm's size and asset growth on profitability. The study also showed a positive association between assets growth rate and economic growth. Similarly, Nugroho (2018) found that asset growth has positive and significant impact on economic growth and banking sector profitability. Anbar and Alper (2011) examined the bank-specific and macroeconomic determinants of the bank's profitability in Turkey. The study found that the banks could improve their profitability through proper lending and increasing assets thus improving overall economic condition. Alkilani and Kaddumi (2015) revealed that credit finance led to economic growth. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between asset size and economic growth.

## Dividend per share

Ullah et al. (2012) investigated the determinants of the corporate dividend policy of seventy firms from Karachi stock exchange KSE-100 index for the period of eight years ranging from 2003 to 2010. The empirical results found that there is a negative relationship between the dividend payouts and managerial share ownership. Likewise, the study also found that there is a positive relationship between dividend per share and economic growth. Al-Shawawreh (2014) examined the relationship between dividend policy and share price volatility listed in Jordanian stock market. The empirical results of this study showed that there is a significant negative relationship between share price volatility with dividend payout and a very weak positive relationship between dividend yield and share price volatility. Moreover, the study found a significant positive relationship between share price volatility, dividend per share, size and GDP. Dada et al. (2015) examined the determinants of the dividend policy of Nigerian banks. The result of the study found that dividend payment is positively related to GDP, leverage, performance, corporate governance and stock market and last year dividend while it is negatively related with firm's liquidity. Based on it, this study develops the following hypothesis:

H<sub>7</sub>: There is a positive relationship between dividend per share and economic growth.

# 3. Results and discussion

## Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2011/12 to 2018/19.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 26 Nepalese commercial banks for the study period of 2011/12 to 2018/19. The dependent variables are GDP (Gross domestic product as measured by gross domestic product of the year, Rupees in billion) and PCI (Per capita income as measured by average income earned per person, in US dollar). The independent variables are SP (Share price as measured by closing market share price of the year, in Rupees), SR (Share return as measured by difference between current year share price and previous year share price to current year share price, in percentage), EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rupees), PER (Price earnings ratio as measured by the ratio of market value per share to earnings per share, in times), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), AS (Asset size as measured by the total assets, Rupees in billion) and DPS (Dividend per share as measured by total dividends paid out over an entire year divided by the number of outstanding ordinary shares issued, in Rupees).

| Variables | Minimum | Maximum | Mean   | SD     |
|-----------|---------|---------|--------|--------|
| SP        | 0.00    | 5123.00 | 609.55 | 646.54 |
| SR        | -87.38  | 256.60  | 12.46  | 55.14  |
| EPS       | -40.23  | 198.53  | 28.18  | 21.81  |
| PER       | -3.41   | 83.94   | 21.23  | 13.38  |
| ROA       | -3.43   | 4.01    | 1.56   | 0.82   |
| AS        | 5.70    | 217.70  | 70.40  | 41.47  |
| DPS       | 0.00    | 105.26  | 19.23  | 15.71  |
| GDP       | 15.27   | 34.64   | 23.42  | 6.26   |
| PCI       | 698.50  | 1071.10 | 781.21 | 82.31  |

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 26 Nepalese commercial banks for the study period of 2011/12 to 2018/19. The dependent variables are GDP (Gross domestic product as measured by gross domestic product of the year, Rupees in billion) and PCI (Per capita income as measured by average income earned per person, in US dollar). The independent variables are SP (Share price as measured by closing market share price of the year, in Rupees), SR (Share return as measured by difference between current year share price and previous year share price to current year share price, in percentage), EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rupees), PER (Price earnings ratio as measured by the ratio of market value per share to earnings per share, in times), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), AS (Asset size as measured by the total assets, Rupees in billion) and DPS (Dividend per share as measured by total dividends paid out over an entire year divided by the number of outstanding ordinary shares issued, in Rupees).

| Variables | GDP     | PCI     | EPS     | DPS     | PER     | ROA   | SP    | SR    | AS |
|-----------|---------|---------|---------|---------|---------|-------|-------|-------|----|
| GDP       | 1       |         |         |         |         |       |       |       |    |
| PCI       | 0.433** | 1       |         |         |         |       |       |       |    |
| EPS       | 0.166   | 0.319** | 1       |         |         |       |       |       |    |
| DPS       | 0.037   | 0.127   | 0.194*  | 1       |         |       |       |       |    |
| PER       | 0.155   | 0.283** | 0.083   | -0.098  | 1       |       |       |       |    |
| ROA       | 0.092   | 0.222** | 0.012   | 0.002   | 0.467** | 1     |       |       |    |
| SP        | 0.257** | 0.340** | 0.690** | 0.290** | 0.021   | 0.011 | 1     |       |    |
| SR        | 0.299** | 0.418** | 0.030   | 0.037   | 0.021   | 0.104 | 0.020 | 1     |    |
| AS        | 0.012   | 0.127   | 0.214*  | 0.067   | 0.283** | 0.177 | 0.165 | 0.133 | 1  |

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

Table 3 shows that earnings per share is positively correlated to gross domestic product. It indicates that increase in earnings per share leads to increase in gross domestic product. Likewise, assets size has a positive relationship with gross domestic product. It indicates that larger the assets size, higher would be the gross domestic product. Moreover, the study shows that price earnings ratio is positively related to gross domestic product. It reveals that higher the price earnings ratio, higher would be the gross domestic product. Likewise, the study also shows that return on assets is also positively related to gross domestic product. It indicates that higher the return on assets, higher would be the gross domestic product. Similarly, dividend per share has a positive relationship with gross domestic product. It reveals that higher the dividend per share, higher would be the gross domestic product. Likewise, share price has a positive relationship with gross domestic product. It means that higher the share price, higher would be the gross domestic product. Furthermore, share return has a positive relationship with gross domestic product. It means that higher the share return, higher would be the gross domestic product.

On the other hand, the results show that earnings per share is positively correlated to per capita income. It indicates that increase in earnings per share leads to increase in per capita income. Likewise, assets size has a positive relationship with per capita income. It indicates that larger the assets size, higher would be the per capita income. However, the study shows that price earnings ratio is positively related to per capita income. It reveals that higher the price earnings ratio, higher would be the per capita income. Likewise, the study also shows that return on assets is also positively related to per capita income. It indicates that higher the return on assets, higher would be the per capita income. Similarly, dividend per share has a positive relationship with per capita income. It reveals that higher the dividend per share, higher would be the per capita income. Likewise, share price has a positive relationship with per capita income. It means that higher the share price, higher would be the per capita income. Furthermore, share return has a positive relationship with per capita income. It means that higher the share return, higher would be the per capita income.

## **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 earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return on gross domestic product.

**Table 4:** Estimated regression results of earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return on gross domestic product

The results are based on panel data of 26 commercial banks with 208 observations for the period of 2011/12 -2018/19 by using the linear regression model and the model is  $GDP_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 DPS_{it} + \beta_3 PER_{it} + \beta_4 ROA_{it} + \beta_5 SP_{it} + \beta_6 SR_{it} + \beta_7 AS_{it} + e_{it}$  where, the dependent variable is GDP (Gross domestic product as measured by gross domestic product of the year, Rupees in billion). The independent variables are SP (Share price as measured by closing market share price of the year, in Rupees), SR (Share return as measured by difference between current year share price and previous year share price to current year share price, in percentage), EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rupees), PER (Price earnings ratio as measured by the ratio of market value per share to earnings per share, in times), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), AS (Asset size as measured by the total assets, Rupees in billion) and DPS (Dividend per share as measured by total dividends paid out over an entire year divided by the number of outstanding ordinary shares issued, in Rupees).

| Model | Intercept           | Regression coefficients of |                  |                  |                  |                    |                    |                    | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|------------------|------------------|------------------|--------------------|--------------------|--------------------|------------------------------------|-------|---------|
|       |                     | EPS                        | DPS              | PER              | ROA              | SP                 | SR                 | AS                 |                                    |       |         |
| 1     | 1.171<br>(4.386)**  | 0.038<br>(1.943)           |                  |                  |                  |                    |                    |                    | 0.021                              | 0.561 | 3.774   |
| 2     | 1.869<br>(4.182)**  |                            | 0.023<br>(0.425) |                  |                  |                    |                    |                    | 0.001                              | 0.569 | 0.181   |
| 3     | 1.775<br>(24.968)** |                            |                  | 0.056<br>(1.815) |                  |                    |                    |                    | 0.017                              | 0.562 | 3.295   |
| 4     | 1.868<br>(10.22)**  |                            |                  |                  | 0.004<br>(1.064) |                    |                    |                    | 0.001                              | 0.567 | 1.132   |
| 5     | 5.849<br>(4.296)**  |                            |                  |                  |                  | 0.097<br>(3.064)** |                    |                    | 0.059                              | 0.55  | 9.386   |
| 6     | 1.316<br>(11.843)** |                            |                  |                  |                  |                    | 0.104<br>(3.612)** |                    | 0.082                              | 0.543 | 13.045  |
| 7     | 1.206<br>(2.60)**   |                            |                  |                  |                  |                    |                    | 0.124<br>(3.617)** | 0.113                              | 0.538 | 5.976   |
| 8     | 5.955<br>(4.350)**  | 0.031<br>(1.801)           |                  | 0.049<br>(1.438) | 0.002<br>(0.332) | 0.091<br>(3.048)** |                    |                    | 0.068                              | 0.547 | 4.279   |
| 9     | 7.754<br>(3.529)**  | 0.012<br>(0.489)           | 0.021<br>(1.771) | 0.053<br>(1.621) | 0.003<br>(0.661) | 0.061<br>(2.922)** | 0.112<br>(3.880)** | 0.168<br>(4.22)**  | 0.164                              | 0.519 | 5.371   |

**Notes:**

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

Table 4 shows that the beta coefficients for return on assets are positive with gross domestic product. It indicates that the return on assets has a positive impact on gross domestic product. This finding is consistent with the findings of Kosmidou et al. (2007). Similarly, the beta coefficients for assets size are positive with gross domestic product. It indicates that assets size has a positive impact on gross domestic product. This finding is consistent with the findings of Dahmash et al. (2021). Likewise, the beta coefficients for dividend per share are positive with gross domestic product. It indicates that dividend per share has a positive impact on gross domestic product. This finding is similar to the findings of Ullah et al. (2012). Similarly, the beta coefficients for share price are positive with gross domestic product. It indicates that share price has a positive impact on gross domestic product. This finding is consistent with the findings of Masoud (2013).

Estimated regression results of earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return on per capita income are presented in Table 5.

**Table 5:** Estimated regression results of earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return on per capita income

The results are based on panel data of 26 commercial banks with 208 observations for the period of 2011/12 -2018/19 by using the linear regression model and the model is  $PCI_t = \beta_0 + \beta_1 EPS_t + \beta_2 DPS_t + \beta_3 PER_t + \beta_4 ROA_t + \beta_5 SP_t + \beta_6 SR_t + \beta_7 AS_t + \epsilon_t$  where, the dependent variable is PCI (Per capita income as measured by average income earned per person, in US dollar). The independent variables are SP (Share price as measured by closing market share price of the year, in Rupees), SR (Share return as measured by difference between current year share price and previous year share price to current year share price, in percentage), EPS (Earnings per share as measured by the company's total earnings by the total number of shares outstanding, in Rupees), PER (Price earnings ratio as measured by the ratio of market value per share to earnings per share, in times), ROA (Return on assets as measured by the ratio of net income to total assets, in percentage), AS (Asset size as measured by the total assets, Rupees in billion) and DPS (Dividend per share as measured by total dividends paid out over an entire year divided by the number of outstanding ordinary shares issued, in Rupees).

| Model | Intercept           | Regression coefficients of |                  |                    |                    |                    |                    |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------------|-------|---------|
|       |                     | EPS                        | DPS              | PER                | ROA                | SP                 | SR                 | AS                 |                         |       |         |
| 1     | 2.058<br>(6.906)**  | 0.085<br>(3.822)**         |                  |                    |                    |                    |                    |                    | 0.095                   | 0.627 | 15.069  |
| 2     | 2.438<br>(4.730)**  |                            | 0.005<br>(1.479) |                    |                    |                    |                    |                    | 0.009                   | 0.656 | 2.188   |
| 3     | 2.996<br>(37.361)** |                            |                  | 0.119<br>(3.401)** |                    |                    |                    |                    | 0.073                   | 0.635 | 11.564  |
| 4     | 2.671<br>(12.848)** |                            |                  |                    | 0.012<br>(2.620)** |                    |                    |                    | 0.042                   | 0.645 | 6.864   |
| 5     | 9.613<br>(6.247)**  |                            |                  |                    |                    | 0.172<br>(4.173)** |                    |                    | 0.109                   | 0.622 | 17.411  |
| 6     | 2.605<br>(21.183)** |                            |                  |                    |                    |                    | 0.206<br>(5.301)** |                    | 0.168                   | 0.601 | 28.101  |
| 7     | 1.231<br>(4.424)**  |                            |                  |                    |                    |                    |                    | 0.216<br>(5.730)** | 0.344                   | 0.534 | 24.445  |
| 8     | 5.871<br>(2.736)**  | 0.041<br>(1.564)           |                  |                    | 0.011<br>(2.496)*  | 0.048<br>(2.247)*  | 0.006<br>(5.389)** |                    | 0.308                   | 0.548 | 15.879  |
| 9     | 5.044<br>(2.254)*   | 0.05<br>(1.948)            | 0.339<br>(0.641) | 0.115<br>(3.461)** | 0.003<br>(0.667)   | 0.041<br>(1.980)*  | 0.006<br>(5.665)** | 0.160<br>(2.220)*  | 0.357                   | 0.528 | 13.413  |

**Notes:**

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

Table 5 shows that the beta coefficients for price earnings ratio are positive with per capita income. It indicates that price earnings ratio has a positive impact on per capita income. This finding is consistent with the findings of Ovati (2012). Similarly, the beta coefficients for share return are positive with per capita income. It indicates that share return has a positive impact on per capita income. This finding is similar to the findings of Gokdeniz et al. (2003). Similarly, the beta coefficients for assets size are positive with per capita income. It indicates that assets size has a positive impact on per capita income. This finding



is inconsistent with the findings of Alkilani and Kaddumi (2015). The study also reveals that the beta coefficients for return on assets are positive with per capita income. It indicates that return on assets has a positive impact per capita income. This finding is consistent with the findings of Erina and Lace (2013).

## 4. Summary and conclusion

The banking sector is an important sector for the stabilization of financial systems. It plays a critical role in the economy of our country. Commercial banks help in economic development and growth of the country as money saved in the banks are used to invest in the enterprise or other active industries. Without commercial banks, it is impossible to implement various economic activities of the government. It plays a crucial role in employment, human resource transfer, and capital mobilization.

This study attempts to analyze the effect of banking performance on economic growth of Nepal. The study is based on secondary data of 26 commercial banks with 208 observations for the period from 2011/12 to 2018/19.

The study showed that that earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return have positive effect on gross domestic product of Nepal. In addition, earnings per share, price earnings ratio, return on assets, assets size, dividend per share, share price and share return have positive effect on per capita income. The study concluded that assets size followed by share return are the most influencing factors that explain the changes in the gross domestic product of Nepal. Likewise, the study also concluded that the most dominant factor that explain the economic growth in term of per capita income is assets size followed by share return in the context of Nepal.

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## Abstract

*This study examines the effect of credit risk, liquidity and capital adequacy ratio on the profitability of Nepalese commercial banks. Return on assets and net interest margin are selected as the dependent variables. Similarly, capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio are selected as the independent variables. This study is based on secondary data of 27 Nepalese commercial banks with 135 observations for the period from 2014/15 to 2018/19. The data were collected from Banking and Financial Statistics and Bank Supervision Report 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 capital adequacy ratio on the profitability of Nepalese commercial banks.*

*The study showed that non-performing loan ratio has a negative impact on return on assets and net interest margin. It indicates that increase in non-performing loan ratio leads to decrease in return on assets and net interest margin. Similarly, cash reserve ratio has a negative impact on return on assets and net interest margin. It indicates that increase in cash reserve ratio leads to decrease in return on assets and net interest margin. Likewise, credit to deposit ratio has a positive impact on return on assets and net interest margin. This indicates that higher the credit to deposit ratio, higher would be the return on assets and net interest margin. Likewise, capital adequacy ratio has a positive impact on return on assets and net interest margin. It indicates that higher the capital adequacy ratio, higher would be the return on assets and net interest margin. Similarly, bank size has a positive impact on return on assets and net interest margin. It indicates that increase in bank size leads to increase in return on assets and net interest margin.*

**Key words:** Return on assets, net interest margin, capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit deposit ratio.

# 1. Introduction

All banks are exposed to a variety of risks, including credit risk, liquidity risk, foreign exchange risk, market risk, and interest rate risk. Risk management in the banking sector is important not only because of the global financial crisis experienced in recent years but also due to its greater impact on bank's financial performance, growth and survival. Banks generally perform the intermediation role by accepting deposits from the savers and lending the money to borrowers. In doing so, they are exposed to various risks, which directly and/or indirectly influence their profitability (Sufian and Chong, 2008). Largely, a sound and profitable banking system is in a better position to endure negative distress and contribute more significantly to the growth of the financial system. Likewise, failures of individual banks adversely affect the economy and the society at large (Kolapo et al., 2012). Poor banking performance can lead to banking failure and crisis which have negative repercussions on the economic growth. The profitability of a bank depends on its ability to foresee, avoid and monitor risk, possible to cover losses brought about by risk arisen. It also has the net effect of increasing the ratio of substandard credits in the bank's credit portfolio and decreasing the bank's profitability. The strength of the banking industry is an important prerequisite to ensure the stability and growth of economy. As a consequence, the assessment of banks' financial condition is a fundamental goal for regulators (Crockett, 2002). The default of a small number of customers may result in a very large loss for the bank. Bank's capital is also widely used to analyze the status of a bank's financial power. The level of loan loss provisions indicates the bank's asset quality and points out changes in the future performance. A high ratio indicates low credit quality and lower profitability. To manage and safeguard the banking business from the NPLs, different credit policies are used, one of those is to increase the loan loss provisions (LLPs). Loan loss provisions are used as a cushion to adapt to the expected loss resulted from the missed payment of installment on a bank's loan portfolio (Ozili and Outa, 2017).

According to Ozili (2017), when the quality of lending is not good in a given market, high loan loss provisions could occur, which could lead to higher non-performing loans, eventually leading towards lower bank profitability. Akinlo (2010) investigated the long-run relationship and causality issues between firm size and profitability in 66 firms in Nigeria by using the panel co-integration method between 1999 and 2007. The empirical result showed that there is a positive and long run relationship between firm size and profitability. Fisseha (2015) analyzed the profitability of commercial banks on the basis of bank size, capital adequacy, liquidity risk, credit risk, management efficiency, labor efficiency, inflation rate and real GDP rate. The study showed a positive impact of bank size, capital adequacy and liquidity risk on the profitability of commercial banks. Similarly, Obehioye and Osahon (2013) investigated the determinants of corporate profitability in developing economies. The study found that firm size has a positive impact on the return on assets. Moreover, Ekwe and Duru (2012) argued that there is a strong positive relationship between firm size and profitability.

According to Lartey et al. (2013), there is a very weak positive relationship between the liquidity and the profitability of the listed banks in Ghana Stock Exchange. Malimi (2017) showed that capital adequacy and profitability have insignificant influence on non-performing loans. However, loan to asset ratio and interest margin have a significant influence on non-performing loans. Similarly, Warrad et al. (2015) stated that when banks hold adequate liquid assets, their profitability would improve. Adequate liquidity helps the bank to minimize liquidity risk and financial crises. The bank can absorb any possible unforeseen financial position. Likewise, Fumani (2015) examined the effect of capital structure on firm value, the rate of return on equity and earnings per share of listed companies in Tehran stock exchange. The study showed that



there is a significant negative relationship between return on equity and firm value. Similarly, Bauer et al. (2004) revealed that there is a negative association between return on equity and firm value in the context of European firms. Wood and Skinner (2018) investigated the determinants of non-performing loans in Barbados. The results indicated that the bank-specific factors such as return on equity, return on assets, capital adequacy ratio and loan to deposit ratio are significant determinants of non-performing loans. Likewise, Lukorito et al. (2014) concluded that if liquid assets are held excessively, profitability could diminish because they have no or little interest generating capacity.

Christaria and Kurnia (2016) examined the impact of financial ratios, operational efficiency and non-performing loan towards commercial bank profitability. The study found that non-performing loan has a significant impact on return on assets. In addition, Kurawa and Garba (2014) assessed the effect of credit risk management (CRM) on the profitability of Nigerian banks. The study revealed that non-performing loans has a negative effect on profitability. Husna and Satria (2019) determined the effect of return on assets, debt to asset ratio (DAR), current ratio (CR), firm size, and dividend payout ratio (DPR) to the firm value of manufacturing companies listed in Indonesia Stock Exchange for the period 2013-2016. The study found that the return on asset and firm size have effects on firm value. However, current ratio and leverage ratio have negative effects on firm value. Cheng and Tzeng (2011) examined the effect of leverage on firm values using 645 companies listed in Taiwan Securities Exchange (TSE) from 2000-2009. The study found a negative effect of leverage and credit to deposit ratio on firm values. Similarly, Gamayuni (2015) examined the relationship between intangible assets, financial policies, and financial performance to the firm value at going-public company in Indonesia. The results showed that intangible assets, financial policies and financial performance have significant influence on the firm value simultaneously. The study also showed that excess liquid assets have negative effect on firm value. Satria and Husna (2019) examined the effects of return on asset, debt to asset ratio, current ratio, firm size, and dividend pay-out ratio on firm value. The study showed that there is a positive and significant effect of return to assets on firm value. Likewise, Zheng et al. (2018) investigated the factors affecting bank credit risk. The study concluded that profitability, capital and bank size are inversely associated with bank credit risk. In addition, Pham (2021) showed that banks' characteristics, bank size and financial leverage have negative impact on credit risk. Likewise, Barua (2001) showed that there is a positive link between liquidity and capital adequacy in the context of Czech commercial banks.

In the context of Nepal, Neupane (2020) concluded that the profitability of Nepalese commercial banks measured by net interest margin (NIM) is significantly influenced by capital adequacy, absolute number of branches and annual inflation rate. Likewise, Adhikari et al. (2020) found that liquidity ratio, non-performing loan has a negative impact on ROA and ROE. The study also revealed that bank capital has a significant impact on profitability of Nepalese commercial banks. Similarly, Budhathoki and Rai (2020) examined the effect of firm specific factors on the profitability of Nepalese commercial banks during 2002/03-2016/17. The study identified that asset quality, capital adequacy ratio and operating efficiency have a negative and significant impact on return on assets. Humagain et al. (2022) assessed the effect of internal and external factors on the profitability of Nepalese commercial banks. The study revealed that equity to total assets has a positive relationship with return on assets and return on equity. Moreover, total loan to total assets ratio is positively associated with return on assets and return on equity. It indicates that the increase in total loan to total assets ratio leads to increase in return on assets and return on equity.

The above discussion shows that empirical evidences vary greatly across the studies concerning the effect of capital risk, liquidity risk and capital adequacy ratio on 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 examine the effect of capital risk, liquidity and capital adequacy ratio on the profitability in the context of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio with return on asset and net interest margin 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered for 27 commercial banks in Nepal with 135 observations for the period of 2014/15 to 2018/19. The main sources of data include Banking and Financial Statistics published by Nepal Rastra Bank 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 number 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     | Agricultural Development Bank Limited  | 2014/15-2018/19 | 5            |
| 2     | Bank of Kathmandu Limited              | 2014/15-2018/19 | 5            |
| 3     | Century Commercial Bank Limited        | 2014/15-2018/19 | 5            |
| 4     | Citizens Bank International Limited    | 2014/15-2018/19 | 5            |
| 5     | Civil Bank Limited                     | 2014/15-2018/19 | 5            |
| 6     | Everest Bank Limited                   | 2014/15-2018/19 | 5            |
| 7     | Global IME Bank Limited                | 2014/15-2018/19 | 5            |
| 8     | Himalayan Bank Limited                 | 2014/15-2018/19 | 5            |
| 9     | Kumari Bank Limited                    | 2014/15-2018/19 | 5            |
| 10    | Laxmi Bank Limited                     | 2014/15-2018/19 | 5            |
| 11    | Machhapuchchhre Bank Limited           | 2014/15-2018/19 | 5            |
| 12    | Mega Bank Nepal Limited                | 2014/15-2018/19 | 5            |
| 13    | Nabil Bank Limited                     | 2014/15-2018/19 | 5            |
| 14    | Nepal Bangladesh Bank Limited          | 2014/15-2018/19 | 5            |
| 15    | Nepal Bank Limited                     | 2014/15-2018/19 | 5            |
| 16    | Nepal Credit and Commerce Bank Limited | 2014/15-2018/19 | 5            |
| 17    | Nepal Investment Bank Limited          | 2014/15-2018/19 | 5            |
| 18    | Nepal SBI Bank Limited                 | 2014/15-2018/19 | 5            |
| 19    | NIC Asia Bank Limited                  | 2014/15-2018/19 | 5            |
| 20    | NMB Bank Limited                       | 2014/15-2018/19 | 5            |

|                                     |                                       |                 |            |
|-------------------------------------|---------------------------------------|-----------------|------------|
| 21                                  | Prabhu Bank Limited                   | 2014/15-2018/19 | 5          |
| 22                                  | Prime Commercial Bank Limited         | 2014/15-2018/19 | 5          |
| 23                                  | Rastriya Banijya Bank Limited         | 2014/15-2018/19 | 5          |
| 24                                  | Sanima Bank Limited                   | 2014/15-2018/19 | 5          |
| 25                                  | Siddhartha Bank Limited               | 2014/15-2018/19 | 5          |
| 26                                  | Standard Chartered Bank Nepal Limited | 2014/15-2018/19 | 5          |
| 27                                  | Sunrise Bank Limited                  | 2014/15-2018/19 | 5          |
| <b>Total number of observations</b> |                                       |                 | <b>135</b> |

Thus, the study is based on the 135 observations.

## The model

The model estimated in this study assumes that bank profitability depends on capital risk, liquidity risk and capital adequacy ratio. The dependent variables are return on assets and net interest margin. The selected independent variables are capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio. Therefore, the following model equation is designed to test the hypothesis.

Profitability = f (CAR, NPL, BZ, CRR and CDR)

More specifically, the given model has been segmented into the following models:

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BZ_{it} + \beta_4 CRR_{it} + \beta_5 CDR_{it} + e_{it}$$

$$NIM_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BZ_{it} + \beta_4 CRR_{it} + \beta_5 CDR_{it} + e_{it}$$

Where,

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

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

CRR = Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage.

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

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

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

CDR = Credit to deposit ratio as measured by the total credit to total deposit, in percentage.

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

## Capital adequacy ratio

Lee and Hsieh (2013) assessed the effect of bank capital on profitability in the context of 48 Asian countries. The study found that banks that have large sum of equity capital have positive effect on bank performance. In addition, Ezike and Oke (2013) investigated the determinants of profitability in the case of Jordanian commercial banks. The study concluded that there is a positive association between capital adequacy ratio and bank profitability. Alshatti (2016) concluded that capital adequacy ratio and leverage positively influence the banks' profitability. Similarly, assets quality negatively affects the banks' profitability. Ndifon and Ubana (2014) revealed a positive and significant relationship between capital adequacy and banks' profitability. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship of capital adequacy ratio with bank profitability.

## Non-performing loan ratio

Alshebmi (2020) assessed the non-performing loans and their effect on the profitability of Saudi Arabia banking sector. The study found that there is a negative but insignificant relationship between non-performing loans ratio and return on assets ratio. Likewise, Kadioglu et al. (2017) found that the significant, negative relationship between non-performing loans and bank profitability. In addition, Nwosu et al. (2020) analyzed the relationship between non-performing loans and profitability of the Nigerian commercial banks. The study found that there is a negative and statistically significant impact of non-performing loans on banks' profitability. Altunbas et. al (2000) found that there is a negative relationship between non-performing loans ratio and bank performance in the context of Japan. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is negative relationship of non-performing loan ratio with bank profitability.

## Bank size

Anggari and Dana (2020) found that bank size has a positive and significant effect on the profitability of banking companies listed on the Indonesia stock exchange. Ferrouhi (2014) found that bank size has positive impact on bank profits. Similarly, Irawati and Maksum (2017) revealed that firm size has a positive and significant effect on profitability (ROA). The study also showed that larger the firm, higher would be the level of profitability. Demirguc-Kunt and Levine (1996) showed that there is a positive relationship between bank size and performance level. The study found that higher funds can easily meet their rigid capitals so that they can have extra funds for giving loans to borrowers and thereby increase their profits and earning levels. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of bank size with bank profitability.

## Cash reserve ratio

Cash reserve ratio is one of the monetary policy tools used by the central bank to control money supply in the economy. This in turn has a significant impact on the interest rates, liquidity and profitability of the banks (Onyeiwu, 2012). Malik and Ahmed (2013) found that there is a negative association between cash reserve ratio and profitability. The study supports the trade-off theory of liquidity and profitability. Any increase in liquidity will cause a diminishing trend in asset utilization capability of the firm. Abid and Lodhi (2015) asserted that changes in cash reserve ratio (CRR) have inverse impact on banks profitability. Similarly, Bhunia et al. (2011) revealed that the cash reserve ratio is negatively associated with bank profitability. Pal et al. (2019) revealed that loan to deposit ratio, non-performing loan and reserve requirement ratio are negatively related to return on assets. It indicates that higher the reserve requirement ratio, lower would be the return on assets. Similarly, reserve requirement is negatively related to net interest margin. It means higher the reserve requirement lower would be the net interest margin. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a negative relationship between cash reserve ratio and bank profitability.

## Credit to deposit ratio

Credit to deposit ratio is the proportion of loan assets created by a bank from the deposits received. Supriyono and Herdhayinta (2019) showed that return on assets (ROA) and return on equity (ROE) are significantly determined by the loan to deposit ratio. In addition, Eltabakh et al. (2014) analyzed the profitability and its determinants between Islamic and conventional banks listed in Qatar Exchange. The results indicated that there is a statistically significant positive relationship between profitability and loan to deposit ratio. Al-Khalaf (2014) found that the loan to deposit ratio and bank size have a positive and significant impact on banks' financial performance. Likewise, Gebremichael and Ababa (2016) examined the impact of capital structure on profitability of commercial bank of Ethiopia. The study argued that loan to deposit ratio has statistically significant and positive relationship with firm profitability. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between credit to deposit 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 2014/15 to 2018/19.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 27 Nepalese commercial banks for the study period of 2014/15 to 2018/19. Dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). Independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), BZ (Bank size as measured by total assets, Rs in billion), NPL (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage) and CDR (Credit to deposit ratio as measured by the total credit to total deposit, in percentage).

| Variables | Minimum | Maximum | Mean  | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| ROA       | 0.01    | 3.12    | 1.68  | 0.57           |
| NIM       | 1.39    | 5.60    | 3.20  | 0.66           |
| CAR       | 7.49    | 22.99   | 13.42 | 2.48           |
| NPL       | 0.02    | 8.83    | 1.68  | 1.57           |
| BZ        | 24.71   | 230.52  | 92.42 | 43.06          |
| CRR       | 2.37    | 35.14   | 14.54 | 8.15           |
| CDR       | 48.32   | 95.64   | 81.93 | 9.10           |

Source: SPSS output

### Correlation analysis

Having indicated the descriptive statistics, Pearson's correlation coefficients are computed, and the results are presented in Table 3. More specifically, it shows the correlation coefficients of dependent and independent variables for Nepalese commercial banks.

**Table 3: Pearson's correlation coefficients matrix**

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 27 Nepalese commercial banks for the study period of 2014/15 to 2018/19. Dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). Independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), BZ (Bank size as measured by total assets, Rs in billion), NPL (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage) and CDR (Credit to deposit ratio as measured by the total credit to total deposit, in percentage).

| Variables | ROA     | NIM      | NPL     | CRR      | CDR     | CAR    | BZ |
|-----------|---------|----------|---------|----------|---------|--------|----|
| ROA       | 1       |          |         |          |         |        |    |
| NIM       | 0.608** | 1        |         |          |         |        |    |
| NPL       | -0.089  | -0.557** | 1       |          |         |        |    |
| CRR       | -0.040  | -0.371** | 0.681** | 1        |         |        |    |
| CDR       | 0.057   | 0.118    | 0.126   | 0.016    | 1       |        |    |
| CAR       | 0.060   | 0.082    | -0.152  | 0.041    | 0.296** | 1      |    |
| BZ        | 0.480** | 0.365**  | 0.043   | -0.225** | 0.158   | -0.140 | 1  |

Source: SPSS output

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

Table 3 shows that non-performing loan ratio is negatively correlated to return on assets. It indicates that increase in non-performing loan ratio leads to decrease in return on assets. Similarly, cash reserve ratio is negatively correlated to return on assets. It indicates that increase in cash reserve ratio leads to decrease in return on assets. Likewise, credit to deposit ratio is positively correlated to return on assets. This indicates that higher the credit to deposit ratio, higher would be the return on assets. Likewise, capital adequacy ratio is positively correlated to return on assets. It indicates that higher the capital adequacy ratio, higher would be the return on assets. Similarly, bank size is positively correlated to return on assets. It indicates that increase in bank size leads to increase in return on assets.

The result also shows that non-performing loan ratio is negatively correlated to net interest margin. It indicates that increase in non-performing loan ratio leads to decrease in net interest margin. Similarly, cash reserve ratio is negatively correlated to net interest margin. It indicates that increase in cash reserve ratio leads to decrease in net interest margin. Likewise, credit to deposit ratio is positively correlated to net interest margin. This indicates that higher the credit to deposit ratio, higher would be the net interest margin. Likewise, capital adequacy ratio is positively correlated to net interest margin. It indicates that higher the capital adequacy ratio, higher would be the net interest margin. Similarly, bank size is positively correlated to net interest margin. It indicates that increase in bank size 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. More specifically, it shows the regression results of capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio on return on assets of Nepalese commercial banks.

**Table 4:** Estimated regression results of capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio on return on assets

The results are based on panel data of 27 commercial banks with 135 observations for the period of 2014/15-2018/19 by using the linear regression model and the model is  $ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BZ_{it} + \beta_4 CRR_{it} + \beta_5 CDR_{it} + \epsilon_{it}$  where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). Independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), BZ (Bank size as measured by total assets, Rs in billion), NPL (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage) and CDR (Credit to deposit ratio as measured by the total credit to total deposit, in percentage).

| Model | Intercept           | Regression coefficients of |                   |                  |                    |                    | Adj.<br>R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|-------------------|------------------|--------------------|--------------------|----------------------------|-------|---------|
|       |                     | NPL                        | CRR               | CDR              | CAR                | BZ                 |                            |       |         |
| 1     | 1.493<br>(17.862)** | -0.141<br>(2.274)*         |                   |                  |                    |                    | 0.081                      | 0.638 | 5.205   |
| 2     | 1.593<br>(19.459)** |                            | -0.036<br>(0.497) |                  |                    |                    | 0.005                      | 0.671 | 0.247   |
| 3     | 1.346<br>(4.273)**  |                            |                   | 0.003<br>(0.701) |                    |                    | 0.003                      | 0.673 | 0.489   |
| 4     | 1.413<br>(6.763)**  |                            |                   |                  | 0.211<br>(2.743)** |                    | 0.103                      | 0.619 | 9.551   |
| 5     | -3.787<br>(4.764)** |                            |                   |                  |                    | 1.135<br>(6.743)** | 0.225                      | 0.589 | 45.461  |
| 6     | 1.441<br>(6.669)**  |                            | -0.039<br>(0.527) |                  | 0.012<br>(0.762)   |                    | 0.008                      | 0.671 | 0.413   |
| 7     | -4.54<br>(5.204)**  |                            | -0.063<br>(0.964) |                  | 0.024<br>(1.811)   | 1.215<br>(7.021)** | 0.236                      | 0.584 | 16.793  |
| 8     | -4.422<br>(4.992)** | -0.088<br>(1.799)          | -0.009<br>(0.096) |                  | 0.027<br>(1.941)   | 1.179<br>(6.586)** | 0.235                      | 0.585 | 12.724  |
| 9     | -4.333<br>(4.879)** | -0.049<br>(1.019)          | -0.003<br>(0.034) | 0.004<br>(1.156) | 0.033<br>(2.229)*  | 1.213<br>(6.694)** | 0.236                      | 0.585 | 10.469  |

**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 loan ratio are negative with return on assets. It indicates that non-performing loan ratio has a negative impact on return on assets. This finding is similar to the findings of Altunbas et. al (2000). Similarly, the beta coefficients for cash reserve ratio are negative with return on assets. It indicates that cash reserve ratio has a negative impact on return on assets. This finding is consistent with the findings of Malik and Ahmed (2013). Likewise, the beta coefficients for credit to deposit ratio are positive with return on assets. It indicates that credit to deposit ratio has a positive impact on return on assets. This finding is consistent with the findings of Supriyono and Herdhayinta (2019). 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 similar to the findings of Ezike and Oke (2013). Likewise, the beta coefficients for bank size are positive with return on assets. It indicates that bank size has a positive and significant impact on return on assets. This finding is consistent with the findings of Anggari and Dana (2020).



Table 5 shows the regression results of capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio on net interest margin of Nepalese commercial banks.

**Table 5:** Estimated regression results of capital adequacy ratio, non-performing loan, bank size, cash reserve ratio and credit to deposit ratio on net interest margin

The results are based on panel data of 27 commercial banks with 135 observations for the period of 2014/15-2018/19 by using the linear regression model and the model is  $NIM_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BZ_{it} + \beta_4 CRR_{it} + \beta_5 CDR_{it} + e_{it}$  where, the dependent variable is (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). Independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), BZ (Bank size as measured by total assets, Rs in billion), NPL (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loans, in percentage), CRR (Cash reserve ratio as measured by the ratio of reserve required to bank deposits, in percentage) and CDR (Credit to deposit ratio as measured by the total credit to total deposit, in percentage).

| Model | Intercept           | Regression coefficients of |                     |                  |                    |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|---------------------|------------------|--------------------|--------------------|-------------------------|-------|---------|
|       |                     | NPL                        | CRR                 | CDR              | CAR                | BZ                 |                         |       |         |
| 1     | 2.682<br>(33.194)** | -0.497<br>(8.268)**        |                     |                  |                    |                    | 0.306                   | 0.646 | 68.355  |
| 2     | 2.867<br>(32.478)** |                            | -0.388<br>(4.918)** |                  |                    |                    | 0.132                   | 0.723 | 24.185  |
| 3     | 2.671<br>(7.353)**  |                            |                     | 0.007<br>(1.459) |                    |                    | 0.007                   | 0.773 | 2.129   |
| 4     | 2.957<br>(12.222)** |                            |                     |                  | 0.018<br>(1.012)   |                    | 0.001                   | 0.776 | 1.025   |
| 5     | -1.52<br>1.554      |                            |                     |                  |                    | 1.001<br>(4.826)** | 0.127                   | 0.725 | 23.294  |
| 6     | 2.687<br>(31.815)** | -0.303<br>(6.156)**        | -0.017<br>(0.174)   |                  |                    |                    | 0.301                   | 0.648 | 33.975  |
| 7     | -2.303<br>(2.702)** | -0.229<br>(4.931)**        | -0.173<br>(1.861)   |                  |                    | 1.052<br>(5.877)** | 0.428                   | 0.587 | 39.194  |
| 8     | -3.119<br>(3.635)** | -0.263<br>(5.725)**        | -0.122<br>(1.336)   |                  | 0.046<br>(3.399)** | 1.094<br>(6.308)** | 0.466                   | 0.567 | 34.353  |
| 9     | -3.022<br>(3.516)** | -0.276<br>(5.886)**        | -0.109<br>(1.184)   | 0.005<br>(1.313) | 0.053<br>(3.652)** | 1.132<br>(6.453)** | 0.468                   | 0.566 | 27.961  |

**Notes:**

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

Table 5 shows that the beta coefficients for non-performing loan ratio are negative with net interest margin. It indicates that non-performing loan ratio has a negative impact on net interest margin. This finding is similar to the findings of Nwosu et al. (2020). Similarly, the beta coefficients for cash reserve ratio are negative with net interest margin. It indicates that cash reserve ratio has a negative impact on net interest margin. This finding is consistent with the findings of Abid and Lodhi (2015). Likewise, the beta coefficients for credit to deposit ratio are positive with net interest margin. It indicates that credit to deposit ratio has a positive impact on net interest margin. This finding is consistent with the findings of Gebremichael and Ababa (2016). Similarly, the beta coefficients for capital adequacy ratio are positive with

net interest margin. It indicates that capital adequacy ratio has a positive impact on net interest margin. This finding is similar to the findings of Alshatti (2016). Likewise, the beta coefficients for bank size are positive with net interest margin. It indicates that bank size has a positive and significant impact on net interest margin. This finding is consistent with the findings of Demirguc-Kunt and Levine (1996).

## 4. Summary and conclusion

Profitability is one of the major targets of any business sector as it boosts the economic growth of the country. There are several internal and external factors that affects the profitability of commercial banks. In order to maintain the financial soundness and efficiency, authorities impose regulations on banks to ensure safeness and soundness of the banking system. Credit risk is the exposure faced by banks when a borrower (customer) defaults in honoring debt obligations on due date or at maturity. This risk is capable of putting the bank in distress if not adequately managed. An efficient banking sector can promote economic growth, while credit insolvencies could result in systematic crisis. Capital requirements for banks have traditionally been regarded as one of the main tools to guarantee the financial stability of the banking sector. Capital requirements are regulations that limit the volume of leverage that banks can take on and also the volume of quality capital banks must attain.

This study attempts to effect of credit risk, liquidity and capital adequacy ratio on the profitability of Nepalese commercial banks. The study is based on secondary data of 27 commercial banks with 135 observations for the period from 2014/15 to 2018/19.

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

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## Abstract

*This study examines the determinants of the stability and profitability of Nepalese commercial banks. The selected dependent variables are Z-score and return on assets. Similarly, bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation are selected as the independent variables. This study is based on secondary data of 20 commercial banks with 120 observations for the study period from 2015/16 to 2020/21. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of different bank specific and macro-economic variables on the stability and profitability of Nepalese commercial banks.*

*The study showed that non-performing loan ratio has a negative impact on Z-score and return on asset. It means that increase in non-performing loan ratio leads to decrease in Z-score and return on asset. Furthermore, cash reserve ratio has a negative impact on Z-score. It indicates that increase in cash reserve ratio leads to decrease in Z-score. However, gross domestic product growth has a positive impact on Z-score and return on asset. It means that increase in gross domestic product growth leads to increase in Z-score and return on asset. In addition, capital adequacy ratio has a positive impact on return on asset. It means that increase in capital adequacy ratio leads to increase in return on asset.*

**Key words:** Stability, profitability, return on assets, gross domestic product growth, non-performing loan ratio, inflation, capital adequacy ratio and cash reserve ratio.

# 1. Introduction

Banking sector in emerging economies has seen important transformations in the development of financial market. The banking system and financial institutions have faced difficulties how to maintain their operational activities, relieve losses and the need of liquidity. The financial stability and sustainable development have become a key to global social and economic development (Shair et al., 2021). A healthy bank could predominantly promote more lending and reduce transaction fees. However, bank has a high cost of transactions such as banking fees, overhead, and customer service which will reduce business's profitability and economic performance (Nguyen, 2020). The central bank always seeks to ensure that the country has a highly healthy financial system, as the stability of the financial institutions and financial markets are the mirror of the country's economy. The main role of the bank is to mobilize the capital from surplus units to deficit units whether for government, firms, or individuals (Oudat and Ali, 2020). Banks are also the ultimate vendors of transmitting effective monetary policy of the central bank of the economy. Thus, they share the responsibility of stabilizing economy (Shoaib, 2011). The soundness of banking sector is very critical to the health of the entire economy (Sufian and Chong, 2008)

Al-Qudah and Jaradat (2013) examined the effect of macroeconomic variables (external variables) and bank characteristic (internal variables) on the profitability of Jordanian Islamic banks for the period from 2000 to 2011. The study revealed that capital adequacy and bank size have a positive and significant impact on return on assets (ROA) and return on equity (ROE). Boateng (2018) investigated the determinants of profitability of banks in India and Ghana to find out the factors that make significant impact on profitability of banks in both India and Ghana. The study found that credit risk, net interest margin, capital adequacy and inflation have the significant impact on profitability of banks in both Ghana and India. However, bank size has an insignificant impact on profitability of Indian banks. In addition, 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 two risks has significant and negative impact on bank stability. Similarly, Jokipii and Monnin (2013) examined the effect of real output growth and inflation on the stability of banking sector. The study found that there is no relationship between banking sector stability and inflation. Likewise, Diaconu and Oanea (2014) examined whether there is difference in the determinants of bank stability for commercial and cooperative banks. The study found that GDP has significant positive impact on bank stability for cooperative banks. The study also found that there is no significant relationship of any variable on bank stability for commercial banks. In addition, Al-Homaidi et al. (2018) found that bank-specific determinants such as liquidity, capital adequacy, bank size, deposit, leverage, asset quality, operating efficiency, asset management, and leverage are highly significant to bank profitability. However, macroeconomic factors like interest rates, GDP, inflation, and exchange rates have significant and negative effects on bank profitability. Similarly, Karim et al. (2003) performed a comparative analysis of 58 commercial banks, 5 Islamic banks and overall banking industry of Indonesia. The study concluded that there is a significant relationship between macroeconomic variables and bank stability for commercial banks and overall banking industry of Indonesia. The study found no evidence of relationship between Z-score and macroeconomic variables in case of Islamic banks.

Islam and Rana (2019) examined the determinants of bank profitability in Bangladesh for the period of 2013 to 2017. The study found no significant impact of the macroeconomic factors namely growth rate of GDP, inflation rate and rate of interest on profitability. Likewise, Kapaya and Raphael (2016) examined the impact of bank-specific, industry-specific and macroeconomic determinants of banks profitability. The study found that capital adequacy (TEA) and credit risk (CFR) have significant impact and GDP has



positive and insignificant impact on profitability measured by return on assets (ROA). However, inflation has negative and significant impact on the bank profitability measured by return on assets (ROA). In addition, Saeed (2014) concluded that inflation has a negative impact on banks profitability. Lemi et al. (2020) assessed the macroeconomic and bank specific determinants of commercial bank profitability in Ethiopia. The study concluded that there is no significant impact of cash reserve ratio and bank size on the profitability of commercial banks in Ethiopia. In contrast, inflation and GDP has significant and positive impact on the profitability of commercial banks in Ethiopia.

Wagner (2007) revealed that higher liquidity of companies' assets leads to increase in instability and the externalities associated with banking failures. Moreover, Imbierowicz and Rauch (2014) found that liquidity risk has a negative relationship with firm stability indicating that higher the liquidity risk lower would be the financial stability. Likewise, Muharam (2012) stated that liquidity risk has a negative relationship with financial stability of the company. Furthermore, Khan and Ali (2016) examined the impact of liquidity on the profitability of commercial banks in Pakistan. The study concluded that current ratio has a positive relation with return on assets. Moreover, Edem (2017) analyzed the association between liquidity management and performance of deposit money banks in Nigeria for the study period of 1986–2011. The study found a positive relationship between liquidity, return on assets, net interest margin and deposits. Similarly, Mohamad et al. (2013) assessed the determinants of liquidity of Islamic banks of Malaysia. The study revealed that fixed deposits and saving deposits have positive relationship with liquidity position of Islamic banks. Moreover, Hadian and Phety (2021) indicated that loan to deposit ratio has a positive relationship with the financial performance of Turkish banks. Jovita et al. (2015) showed that loan to deposit ratio has a significant influence on return on assets. Chagwiza (2014) found that there is a positive link between bank liquidity and capital adequacy, total assets, saving deposits, gross domestic product and bank rate. The study also found that the adoption of multi-currency, inflation rate and business cycle have a negative impact on liquidity. Furthermore, Hsieh and Lee (2020) showed that bank liquidity creation is statistically significant and positively related to real economic output, illiquid assets and core deposits.

In the context of Nepal, Poudel (2012) examined the impact of credit risk management on financial performance of commercial banks in Nepal. The study found that capital adequacy ratio has negative and significant relationship with return on assets of Nepalese commercial banks. Bhattarai (2020) investigated the determinants of profitability of commercial banks in Nepal. The study found that the liquidity measured by cash reserve ratio (CRR) has negative but significant impact on profitability. Likewise, Pradhan and Upadhaya (2018) found that firm size measured by total assets and gross domestic product (GDP) have positive impact on profitability of Nepalese commercial banks. However, inflation has a negative relationship with profitability. In addition, Ranabhat (2019) examined the effects of internal factors on financial performance of joint venture banks in Nepal for the period from 2008/09 to 2017/18. The study revealed that there is significant negative impact of asset size on return on assets and positive impact of capital adequacy ratio on ROA return on assets. Likewise, Niroula and Singh (2021) examined the effect of liquidity on financial performance of Nepalese commercial banks. The study found that there is a positive and significant effect of cash reserve ratio and capital adequacy ratio on return on assets of Nepalese commercial banks.

The above discussion shows that empirical evidences vary greatly across the studies on the stability and profitability of 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 main purpose of the study is to analyze the determinants of the stability and profitability of Nepalese commercial banks. Specifically, it examines the relationship of bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth, and inflation with Z-score and return on assets 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 the conclusion.

## 2. Methodological aspects

The study is based on the secondary data which were gathered from 20 commercial banks for the period from 2015/16 to 2020/21, leading to a total of 120 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the 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                                   | Nepal Bank Limited                    | 2015/16 - 2020/21 | 6            |
| 2                                   | Agricultural Development Bank Limited | 2015/16 - 2020/21 | 6            |
| 3                                   | Rastriya Banijya Bank Limited         | 2015/16 - 2020/21 | 6            |
| 4                                   | Nabil Bank Limited                    | 2015/16 - 2020/21 | 6            |
| 5                                   | NMB Bank Limited                      | 2015/16 - 2020/21 | 6            |
| 6                                   | Himalayan Bank Limited                | 2015/16 - 2020/21 | 6            |
| 7                                   | NIC Asia Bank Limited                 | 2015/16 - 2020/21 | 6            |
| 8                                   | Global IME Bank Limited               | 2015/16 - 2020/21 | 6            |
| 9                                   | Prime Commercial Bank Limited         | 2015/16 - 2020/21 | 6            |
| 10                                  | Nepal Investment Bank Limited         | 2015/16 - 2020/21 | 6            |
| 11                                  | Siddhartha Bank Limited               | 2015/16 - 2020/21 | 6            |
| 12                                  | Mega Bank Nepal Limited               | 2015/16 - 2020/21 | 6            |
| 13                                  | Prabhu Bank Limited                   | 2015/16 - 2020/21 | 6            |
| 14                                  | Kumari Bank Limited                   | 2015/16 - 2020/21 | 6            |
| 15                                  | Sanima Bank Limited                   | 2015/16 - 2020/21 | 6            |
| 16                                  | Citizens Bank International Limited   | 2015/16 - 2020/21 | 6            |
| 17                                  | NCC Bank Limited                      | 2015/16 - 2020/21 | 6            |
| 18                                  | Laxmi Bank Limited                    | 2015/16 - 2020/21 | 6            |
| 19                                  | Machhapuchchhre Bank Limited          | 2015/16 - 2020/21 | 6            |
| 20                                  | Bank of Kathmandu Limited             | 2015/16 - 2020/21 | 6            |
| <b>Total number of observations</b> |                                       |                   | <b>120</b>   |

Thus, the study is based on the 120 observations.

## The model

The model used in this study assumes that the stability and profitability of bank depends upon various factors. The dependent variables selected for the study are Z-score and return on assets. Similarly, the selected independent variables are bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation. Therefore, the model takes the following form:

Stability and profitability = f (bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation)

More specifically, the given model has been segmented into following models:

$$\text{Z-score} = \beta_0 + \beta_1 \text{BS} + \beta_2 \text{NPL} + \beta_3 \text{CAR} + \beta_4 \text{CRR} + \beta_5 \text{GDPG} + \beta_6 \text{INFL} + e_{it}$$

$$\text{ROA} = \beta_0 + \beta_1 \text{BS} + \beta_2 \text{NPL} + \beta_3 \text{CAR} + \beta_4 \text{CRR} + \beta_5 \text{GDPG} + \beta_6 \text{INFL} + e_{it}$$

Where,

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

Z-Score = Z-score of return on assets as measured by the return on assets (ROA) plus the equity to assets for bank *i* for the given period divided by the standard deviation (SD) of ROA (%) over the sample period.

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

NPLR = Nonperforming loan ratio as measured by the ratio of non-performing loan to total loan, in percentage.

CAR = Capital adequacy ratio as measured by the ratio of total equity to total assets, in percentage.

CRR = Cash reserve ratio as measured by reserve maintain with central bank to bank deposits, in percentage.

GDPG = Gross domestic product as measured by growth rate of gross domestic product at producer price, in percentage.

INFL = Annual inflation rate as measured by change in consumer price index, in percentage.

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

## Bank size

Parvin et al. (2019) assessed the relationship between profitability, liquidity and bank loan in Bangladesh during 2011-2015. The study revealed that bank size has a positive association with banks' profitability. Likewise, Masood and Ashraf (2012) concluded that there is a positive effect of banks size on banks' profitability. In addition, Sinha and Shrama (2015) investigated the determinants of bank profits and its persistence in Indian banks. The study found that there is positive and statistically significant relationship of bank size with ROA. Moreover, Ali and Puah (2018) examined the impact of bank size and funding risk on banks' stability. The study concluded that bank size has a positive effect on stability under Z-score model. Furthermore, Sufian and Chong (2008) revealed that there is a positive and significant relationship between bank size and bank profitability. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is positive impact of bank size on stability and profitability of commercial banks.

## Credit risk

Gizaw et al. (2015) examined the impact of credit risk on the profitability performance of commercial banks in Ethiopia. The study found that NPLR has statistically significant and negative effect on profitability measured by ROA. The study also asserted that non-performing loan ratio (NPLR) is the major indicator of commercial banks' credit risk. Similarly, Banker et al. (2010) concluded that the NPL ratio has a negative impact on bank productivity. In addition, Alexiou and Sofoklis (2009) examined the determinants of bank profitability. The study found that the value of the credit risk is negatively and significantly related to bank profitability. Similarly, Anh and Phuong (2021) revealed there is negative relationship between non-performing loans and the financial stability of banks. Likewise, Miller and Noulas (1997) found a negative effect of the non-performing loan ratio on the profitability of banks in USA. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is negative impact of credit risk on stability and profitability of commercial banks.

## Capital adequacy ratio

Kurawa and Garwa (2014) investigated the effect of credit risk management on the profitability of Nigerian banks during the period 2002 to 2011 using the generalized least square regression technique. The study found that capital adequacy ratio has a significant positive relationship with ROA. Likewise, Ogboi and Unuafé (2013) found that capital adequacy is positively related to bank's financial performance. In addition, Biswas et al. (2021) examined the effect of credit risk on commercial banks' profitability of Bangladesh. The study concluded that return on assets (ROA) has a statistically significant positive relationship with capital adequacy ratio (CAR). Likewise, Kamran et al. (2019) revealed that capital adequacy ratio is negatively related to Z measure of ROA. Datta and Al Mahmud (2018) found that there is positive and significant relationship between capital adequacy ratio and bank's profitability measured by return on assets (ROA). Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is positive impact of capital adequacy ratio on stability and profitability of commercial banks.

## Cash reserve ratio

Mogwambo (2020) examined the profitability of banking sector and monetary policy. The study revealed that CRR is negatively related to return on assets, return on equity as well as return on investment. The study showed that the bank's profitability declined due to the increase in cash reserve ratio (CRR) of commercial banks in Bangladesh. Similarly, Meshack and Nyamute (2016) concluded that CRR rate negatively influence the financial performance of commercial banks listed on NSE. In addition, Abidi and Lodhi (2015) examined the relationship between reserve requirement ratio and banks profitability in Pakistan. The study revealed that reserve requirement measured by cash reserve ratio (CRR) has negative and significant impact on the financial performance of the commercial banks in Pakistan measured by return on assets (ROA) and return on equity (ROE). Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is negative impact of CRR on stability and profitability of commercial banks.

## Gross domestic product growth

Yahya et al. (2014) examined the impact of political instability, macroeconomic and bank-specific factors on the profitability of Islamic banks. The study found that GDP has positive and significant impact on Yemeni banks' profitability. Similarly, Gazi et al. (2021) found that macroeconomic variable (GDP growth rate) has statistically significant and positive impact on the profitability, represented by return on asset (ROA) and return on equity (ROE). In addition, Ali et al. (2018) investigated the impact of macroeconomic variables on Islamic banks profitability in Brunei. The study revealed that GDP growth rate has positive and significant impact on profitability. Similarly, Adusei (2015) concluded that GDP growth has a positive and statistically significant impact on bank stability. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is positive impact of GDP growth on stability and profitability of commercial banks.

## Inflation

Molyneux and Thornton (1992) examined the determinants of European bank profitability. The study found a positive and statistically significant correlation between inflation rate and bank profitability. Similarly, Claeys and Vennet (2008) found a positive relationship between inflation and profitability. In addition, Garcia-Herrero et al. (2009) investigated the factors that explain the profitability of Chinese banks. The study found the positive relationship between inflation and profitability. Likewise, Kasman et al. (2010) revealed positive relationship between inflation and profitability. Karim et al. (2003) concluded that there is a significant relationship between inflation and bank stability for commercial banks. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is positive impact of inflation on stability and profitability of commercial 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 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 20 Nepalese commercial banks for the study period of 2015/16 to 2020/21. The dependent variables are Z-score (Z-score of return on assets as measured by the return on assets (ROA) plus the equity to assets for bank for the given period divided by the standard deviation (SD) of ROA (%) over the sample period) and ROA (Return on assets as measured by the ratio of net income by total assets, in percentage). The independent variables are BS (Bank size as measured by the total assets, Rs in billion), NPLR (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total equity to total assets, in percentage), CRR (Cash reserve ratio as measured by reserve maintain with central bank to bank deposits, in percentage), GDPG (Gross domestic product as measured by growth rate of gross domestic product at producer price, in percentage) and INFL (Annual inflation rate as measured by change in consumer price index, in percentage).

| Variables | Minimum | Maximum | Mean  | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| Z-score   | 1.92    | 10.98   | 5.87  | 2.14           |
| ROA       | 0.71    | 2.79    | 1.63  | 0.45           |
| BS        | 10.47   | 12.75   | 11.71 | 0.48           |
| NPLR      | 0.01    | 8.83    | 1.74  | 1.44           |
| CAR       | 10.20   | 20.41   | 13.50 | 2.01           |
| CRR       | 2.13    | 27.09   | 8.29  | 4.90           |
| GDPG      | -2.10   | 8.20    | 4.07  | 3.73           |
| INFL      | 3.63    | 8.79    | 5.20  | 1.74           |

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 20 Nepalese commercial banks for the study period from 2015/16 to 2020/21. The dependent variables are Z-score (Z-score of return on assets as measured by the return on assets (ROA) plus the equity to assets for bank for the given period divided by the standard deviation (SD) of ROA (%) over the sample period) and ROA (Return on assets as measured by the ratio of net income by total assets, in percentage). The independent variables are BS (Bank size as measured by the total assets, Rs in billion), NPLR (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total equity to total assets, in percentage), CRR (Cash reserve ratio as measured by reserve maintain with central bank to bank deposits, in percentage), GDPG (Gross domestic product as measured by growth rate of gross domestic product at producer price, in percentage) and INFL (Annual inflation rate as measured by change in consumer price index, in percentage).

| Variables | Z-score  | ROA     | BS       | NPLR   | CAR      | CRR    | GDP      | INFL |
|-----------|----------|---------|----------|--------|----------|--------|----------|------|
| Z-score   | 1        |         |          |        |          |        |          |      |
| ROA       | 0.468**  | 1       |          |        |          |        |          |      |
| BS        | -0.248** | -0.185* | 1        |        |          |        |          |      |
| NPLR      | -0.435** | -0.026  | 0.046    | 1      |          |        |          |      |
| CAR       | -0.094   | 0.188*  | 0.120    | 0.031  | 1        |        |          |      |
| CRR       | -0.048   | 0.015   | -0.043   | 0.043  | -0.151   | 1      |          |      |
| GDP       | 0.215*   | 0.296** | -0.151   | -0.023 | 0.063    | -0.013 | 1        |      |
| INFL      | 0.091    | 0.156   | -0.355** | 0.047  | -0.257** | 0.029  | -0.514** | 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 is negatively correlated to Z-score. It means that increase in bank size leads to decrease in Z-score. Similarly, there is a negative relationship between non-performing loan ratio and Z-score. It means that increase in non-performing loan ratio leads to decrease in Z-score. In addition, there is negative relationship between capital adequacy ratio and Z-score. It means that increase in capital adequacy ratio leads to decrease in Z-score. Furthermore, there is a negative relationship between cash reserve ratio and Z-score. It indicates that increase in cash reserve ratio leads to decrease in Z-score. However, there is a positive relationship between gross domestic product growth and Z-score. It means that increase in gross domestic product growth leads to increase in Z-score. Further, this study shows that there is a positive relationship between inflation rate and Z-score. It means that increase in inflation rate leads to increase in Z-score of Nepalese commercial banks.

Similarly, the result also shows that bank size is negatively correlated to return on asset. It means that increase in bank size leads to decrease in return on asset. Similarly, there is a negative relationship between non-performing loan ratio and return on asset. It means that increase in non-performing loan ratio leads to decrease in return on asset. In addition, there is positive relationship between capital adequacy ratio and return on asset. It means that increase in capital adequacy ratio leads to increase in return on asset. Furthermore, there is a positive relationship between cash reserve ratio and return on asset. It indicates that increase in cash reserve ratio leads to increase in return on asset. However, there is a positive relationship between gross domestic product growth and return on asset. It means that increase in gross domestic product growth leads to increase in return on asset. Further, this study shows that there is a positive relationship between inflation rate and return on asset. It means that increase in inflation rate leads to increase in return on asset of Nepalese commercial banks.

## **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 where bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation with Z-score of Nepalese commercial banks.



**Table 4:** Estimated regression results of bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation rate on Z-score

The results are based on panel data of 20 commercial banks with 120 observations for the period of 2015/16 to 2020/21 by using the linear regression model and the model is  $Z\text{-Score}_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 NPL_{it} + \beta_3 CAR_{it} + \beta_4 CRR_{it} + \beta_5 GDPG_{it} + \beta_6 INFL_{it} + e_{it}$ . The dependent variable is Z-score (Z-score of return on assets as measured by the return on assets (ROA) plus the equity to assets for bank for the given period divided by the standard deviation (SD) of ROA (%) over the sample period). The independent variables are BS (Bank size as measured by the total assets, Rs in billion), NPLR (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total equity to total assets, in percentage), CRR (Cash reserve ratio as measured by reserve maintain with central bank to bank deposits, in percentage), GDPG (Gross domestic product as measured by growth rate of gross domestic product at producer price, in percentage) and INFL (Annual inflation rate as measured by change in consumer price index, in percentage).

| Models | Intercepts          | Regression coefficients of |                     |                   |                   |                    |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|--------|---------------------|----------------------------|---------------------|-------------------|-------------------|--------------------|-------------------|-------------------------|-------|---------|
|        |                     | BS                         | NPLR                | CAR               | CRR               | GDP                | INFL              |                         |       |         |
| 1      | 18.735<br>(4.049)** | -1.099<br>(2.784)**        |                     |                   |                   |                    |                   | 0.054                   | 2.081 | 7.748   |
| 2      | 6.987<br>(25.227)** |                            | -0.645<br>(5.255)** |                   |                   |                    |                   | 0.183                   | 1.934 | 27.614  |
| 3      | 7.217<br>(5.423)**  |                            |                     | -0.101<br>(1.026) |                   |                    |                   | 0.001                   | 2.139 | 1.053   |
| 4      | 6.041<br>(15.651)** |                            |                     |                   | -0.021<br>(0.526) |                    |                   | 0.006                   | 2.146 | 0.277   |
| 5      | 5.364<br>(18.884)** |                            |                     |                   |                   | 0.123<br>(2.389)*  |                   | 0.038                   | 2.098 | 5.708   |
| 6      | 5.281<br>(8.559)**  |                            |                     |                   |                   |                    | 0.112<br>(0.998)  | 0.001                   | 2.139 | 0.996   |
| 7      | 18.82<br>(4.506)**  | -1.013<br>(2.839)**        | -0.630<br>(5.274)** |                   |                   |                    |                   | 0.229                   | 1.878 | 18.662  |
| 8      | 19.26<br>(4.544)**  | -0.984<br>(2.733)**        | -0.623<br>(5.242)** | -0.058<br>(0.666) |                   |                    |                   | 0.225                   | 1.883 | 12.53   |
| 9      | 19.606<br>(4.571)** | -0.99<br>(2.740)**         | -0.624<br>(5.192)** | -0.065<br>(0.746) | -0.021<br>(0.600) |                    |                   | 0.221                   | 1.888 | 9.436   |
| 10     | 17.887<br>(4.172)** | -0.862<br>(2.396)*         | -0.621<br>(5.240)** | -0.081<br>(0.938) | -0.021<br>(0.595) | 0.103<br>(2.229)*  |                   | 0.247                   | 1.856 | 8.803   |
| 11     | 10.574<br>(1.922)   | -0.435<br>(1.062)          | -0.641<br>(5.471)** | -0.038<br>(0.438) | -0.018<br>(0.529) | 0.177<br>(3.060)** | 0.280<br>(2.076)* | 0.268                   | 1.829 | 8.267   |

**Notes:**

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

Table 4 shows that the beta coefficients for bank size are negative with Z-score. It indicates that bank size has a negative impact on Z-score. This finding is similar to the findings of Ali and Puah (2018). In addition, the beta coefficients for non-performing loan ratio are negative with Z-score. It indicates that non-performing loan ratio has a negative impact on Z-score. This finding is consistent with the findings of Anh and Phuong (2021). The beta coefficients for capital adequacy ratio are negative with Z-score. It indicates that capital adequacy ratio has a negative impact on Z-score. This finding is similar to the findings of Kamran et al. (2019). Furthermore, the beta coefficients for cash reserve ratio are negative with Z-score. It indicates that cash reserve ratio has a negative impact on Z-score. This finding is consistent

with the findings of Abidi and Lodhi (2015). Similarly, the beta coefficients for gross domestic product growth are positive with Z-score. It indicates that gross domestic product growth has a positive impact on Z-score. This finding is similar to the findings of Adusei (2015). Likewise, the beta coefficients for inflation are positive with Z-score. It indicates that inflation rate has a positive impact on Z-score. This finding is consistent with the findings of Karim et al. (2003).

Table 5 shows the estimated regression results of bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation on return on assets of Nepalese commercial banks.

**Table 5:** Estimated regression results of bank size, non-performing loan ratio, capital adequacy ratio, cash reserve ratio, gross domestic product growth and inflation on return on assets

The results are based on panel data of 20 commercial banks with 120 observations for the period of 2015/16 to 2020/21 by using the linear regression model and the model is  $ROA_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 NPLR_{it} + \beta_3 CAR_{it} + \beta_4 CRR_{it} + \beta_5 GDPG_{it} + \beta_6 INFL_{it} + \epsilon_{it}$ . The dependent variable is ROA (Return on assets as measured by the ratio of net income by total assets, in percentage). The independent variables are BS (Bank size as measured by the total assets, Rs in billion), NPLR (Nonperforming loan ratio as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total equity to total assets, in percentage), CRR (Cash reserve ratio as measured by reserve maintain with central bank to bank deposits, in percentage), GDPG (Gross domestic product as measured by growth rate of gross domestic product at producer price, in percentage) and INFL (Annual inflation rate as measured by change in consumer price index, in percentage).

| Models | Intercepts          | Regression coefficients of |                     |                   |                   |                    |                   | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|--------|---------------------|----------------------------|---------------------|-------------------|-------------------|--------------------|-------------------|-------------------------|-------|---------|
|        |                     | BS                         | NPLR                | CAR               | CRR               | GDP                | INFL              |                         |       |         |
| 1      | 18.735<br>(4.049)** | -1.099<br>(2.784)**        |                     |                   |                   |                    |                   | 0.054                   | 2.081 | 7.748   |
| 2      | 6.987<br>(25.227)** |                            | -0.645<br>(5.255)** |                   |                   |                    |                   | 0.183                   | 1.934 | 27.614  |
| 3      | 7.217<br>(5.423)**  |                            |                     | -0.101<br>(1.026) |                   |                    |                   | 0.001                   | 2.139 | 1.053   |
| 4      | 6.041<br>(15.651)** |                            |                     |                   | -0.021<br>(0.526) |                    |                   | 0.006                   | 2.146 | 0.277   |
| 5      | 5.364<br>(18.884)** |                            |                     |                   |                   | 0.123<br>(2.389)*  |                   | 0.038                   | 2.098 | 5.708   |
| 6      | 5.281<br>(8.559)**  |                            |                     |                   |                   |                    | 0.112<br>(0.998)  | 0.001                   | 2.139 | 0.996   |
| 7      | 18.82<br>(4.506)**  | -1.013<br>(2.839)**        | -0.630<br>(5.274)** |                   |                   |                    |                   | 0.229                   | 1.878 | 18.662  |
| 8      | 19.26<br>(4.544)**  | -0.984<br>(2.733)**        | -0.623<br>(5.242)** | -0.058<br>(0.666) |                   |                    |                   | 0.225                   | 1.883 | 12.53   |
| 9      | 19.606<br>(4.571)** | -0.99<br>(2.740)**         | -0.624<br>(5.192)** | -0.065<br>(0.746) | -0.021<br>(0.600) |                    |                   | 0.221                   | 1.888 | 9.436   |
| 10     | 17.887<br>(4.172)** | -0.862<br>(2.396)*         | -0.621<br>(5.240)** | -0.081<br>(0.938) | -0.021<br>(0.595) | 0.103<br>(2.229)*  |                   | 0.247                   | 1.856 | 8.803   |
| 11     | 10.574<br>(1.922)   | -0.435<br>(1.062)          | -0.641<br>(5.471)** | -0.038<br>(0.438) | -0.018<br>(0.529) | 0.177<br>(3.060)** | 0.280<br>(2.076)* | 0.268                   | 1.829 | 8.267   |

**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 5 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 Sufian and Chong (2008). Similarly, the beta coefficients for non-performing loan ratio are negative with return on assets. It indicates that non-performing loan ratio has a negative impact on return on assets. This finding is consistent with the findings of Miller and Noulas (1997). 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 Datta and Al Mahmud (2018). In addition, the beta coefficients for cash reserve ratio are positive with return on assets. It indicates that cash reserve ratio has a positive impact on return on assets. This finding is similar to the findings of Meshack and Nyamute (2016). Similarly, the beta coefficients for gross domestic product growth are positive with return on assets. It indicates that gross domestic product growth has a positive impact on return on assets. This finding is similar to the findings of Ali et al. (2018). Likewise, the beta coefficients for inflation are positive with return on assets. It indicates that inflation rate has a positive impact on return on assets. This finding is consistent with the findings of Claeys and Vennet (2008).

## 4. Summary and conclusion

The banking industry is the backbone of the nation economy. A diverse, profitable and stable banking system is the pre-requisite for strong and prosperous economies. Profitability is the ability of shareholders or the firm to earn profits in the form of return on equity (ROE) or return on assets (ROA). Stability refers to risk factors and survival chances in the long-run. Profitable banks are generally considered more stable and vice versa. Financial instability is related to conditions in the financial markets that cause losses or threats to the economy through the operating mechanisms of the financial system.

This study attempts to analyze the determinants of the stability and profitability of Nepalese commercial banks. The study is based on secondary data of 20 commercial banks with 120 observations for the period from 2015/16 to 2020/21.

The study showed that bank size, non-performing loan ratio, capital adequacy ratio and cash reserve ratio have negative impact on Z-score. However, GDP growth and inflation have positive impact on Z-score. Likewise, bank size and non-performing loan ratio have negative impact on return on assets. However, capital adequacy ratio, cash reserve ratio, GDP growth and inflation have positive impact on return on assets. Likewise, the study also concluded that non-performing loan ratio followed by bank size is the most influencing factor that explains the changes in the Z-score of Nepalese commercial banks. Similarly, the study also concluded that gross domestic product growth followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on asset in context of Nepalese commercial banks.

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## Abstract

*The study examines the effect of credit management on the performance of Nepalese commercial banks. Return on assets and return on equity are selected as the dependent variables. The selected independent variables are credit risk, client appraisal, collection policy, credit terms, capital adequacy ratio and non-performing loan. The study is based on primary as well as secondary data. The primary source of data is used to assess the opinions of the respondents regarding client appraisal, collection policy and credit terms in context of Nepalese commercial banks. To achieve the purpose of the study, structured questionnaire is prepared. Similarly, secondary data were collected for the study period from 2013/14 to 2020/21, leading to a total of 128 observations. The secondary 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 the effect of credit risk management on the performance of Nepalese commercial banks.*

*The study showed that capital adequacy ratio has a positive impact on return on assets and return on equity. It means that an increase in capital adequacy ratio leads to increase in return on assets and return on equity. Similarly, non-performing loan has a negative impact on return on assets and return on equity. It means that an increase in non-performing loans leads to a decrease in return on assets and return on equity. Moreover, credit risk has a negative impact on return on assets and return on equity. It means that increase in credit risk leads to decrease in return on assets and return on equity. Furthermore, client appraisal has a positive impact on return on assets and return on equity. It indicates that better client appraisal leads to an increase in return on assets and return on equity. Similarly, credit terms have a positive impact on return on assets and return on equity. It means that greater credit terms lead to an increase in return on assets and return on equity. Likewise, collection policy has a positive impact on return on assets and return on equity. It means that a better collection policy leads to an increase in return on assets and return on equity in Nepalese commercial banks.*

**Key words:** Return on assets, return on equity, capital adequacy ratio, non-performing loan, credit risk, client appraisal, collection policy, credit terms, and credit term.

# 1. Introduction

Incessant crisis in the banking sector has been attributed to poor credit management. According to Myers and Brealey (2003), credit management is the methods and strategies adopted by a firm to ensure that they maintain an optimal level of credit and its effective management. It is an aspect of financial management involving credit analysis, credit rating, credit classification and credit reporting. Credit management is the means by which an entity manages its credit sales. It is a prerequisite for any entity dealing with credit transactions since it is impossible to have a zero credit or default risk. Nzotta (2004) opined that credit management greatly influences the success or failure of commercial banks and other financial institutions. This is because the failure of deposit banks is influenced to a large extent by the quality of credit decisions and thus the quality of the risky assets. Credit management provides a leading indicator of the quality of deposit banks credit portfolio. A key requirement for effective credit management is the ability to intelligently and efficiently manage customer credit lines. In order to minimize exposure to bad debt, over-reserving and bankruptcies, companies must have greater insight into customer financial strength, credit score history and changing payment patterns (Kagoyire and Shukla, 2016).

According to Magali (2013), credit management systems play a vital role in realizing credit offered to the economically active poor and their micro enterprises. Credit risk management in banks has become more important not only because of the financial crisis that the industry is experiencing currently, but also a crucial concept which determine banks' survival, growth and profitability. Kipkoech (2015) stated that credit management systems ensure effective systems, procedures and controls that are aimed at ensuring efficient collection of loans made to clients in order to minimize credit risk. Credit management is implementing and maintaining a set of policies and procedures to minimize the amount of capital tied up in debtors and to minimize the exposure of the business to bad debts (Kagoyire and Shukla, 2016). Credit risk management is very important to banks as it is an integral part of the loan process. Since bank's play an important role in the operation of an economy, the stability of banks is of paramount importance to the financial system. As such, an understanding of the factors that determine their profitability is essential and crucial to the stability of the economy.

Muritala (2013) opined that credit management greatly influences the success or failure of commercial banks and other financial institutions. This is because the failure of deposit banks is influenced to a large extent by the quality of credit decisions and thus the quality of the risky assets. A key requirement for effective credit management is the ability to intelligently and efficiently manage customer credit lines. Claude and Edsion (2018) defined the credit risk management as identification, measurement, monitoring and control of risk arising from the possibility of default in loan repayments. Credit risk is one of the significant risks of banks by the nature of their activities. Changes in credit risk may reflect changes in the health of a bank's loan portfolio which may affect the performance of the institution (Cooper et al., 2003). Sufian (2010) concluded that credit risk has a negative impact on return on assets but positive impact on return on equity. Furthermore, Rifqah and Hassan (2019) investigated the relationship between bank's credit risk, liquidity, and capital adequacy towards its profitability in Indonesia. The study showed that there is a significant negative relationship between net interest margin and return on asset.

Ogunlade and Oseni (2018) showed that credit management practices (client appraisal, credit risk control, and collection policy) have a significant positive influence on financial performance. Credit management is the center of a business entity for both short and long-term survival. Nzotta (2004) stated that credit management greatly influences the success or failure of commercial banks and financial institutions. The term financial performance generally denotes a measure of an organization's overall financial wealth over

a given period of time (Ware, 2015). The performance of the financial system has important role in the country as its failure can disrupt economic development of the country (Das and Ghosh, 2007). The financial performance of a financial institution is evaluated by determining the profitability (Makkar and Singh, 2013). The progress and strength of the financial condition of a country depend on the soundness of its banking sector. Antoine (2015) defined a collection policy as the procedure an institution follows to collect past due account. Collection policies within financial institutions can make the difference between a good and excellent performance for the bank, through making use of opportunities to make the collection processes strategically effective, operationally efficient, and customer oriented. Strict collection procedures are adhered to help to keep debtors alert and reduction of the portfolio at risk.

Alzoubi (2018) concluded a positive relationship between capital adequacy ratio and profitability of banks measured by return on assets. Likewise, Collaku and Aliu (2021) showed a significant negative relationship between non-performing loan and profitability as measured by return on assets. 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. Similarly, Nahar et al. (2020) identified a positive relationship between capital adequacy ratio and profitability. 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, Islam et al. (2017) revealed a significant negative relationship between non-performing loan and profitability of banks in Bangladesh. Kolapo et al. (2012) investigated the quantitative effect of credit risk on the performance of commercial banks in Nigeria over the period of 11 years (2000-2010). The study revealed that non-performing loan and loan loss provision have a negative and statistically significant relationship with return on assets. Ramadhanti et al. (2019) determined the effect of capital adequacy, liquidity, and credit risk on bank profitability. The study found 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.

In Nepalese context, Gyawali (2018) analyzed the non-performing asset and its effects on profitability of Nepalese commercial banks. The study showed that there is a negative impact of non-performing loan on return on assets in context of Nepalese commercial banks. Moreover, Shrestha (2020) investigated the determinants of financial performance of Nepalese commercial banks. The study revealed that management efficiency, asset quality and operational efficiency have significant positive impact on the financial performance of Nepalese commercial banks. Marahatta et al. (2016) examined determinants of bank's performance in Nepalese commercial banks for the period of 2008-2014. The study observed that assets quality, bank size, GDP growth and liquidity have positive relationship with return on assets. The study also revealed that there is negative relationship between capital adequacy and return on assets and GDP growth rate and inflation have positive impact on return on equity. Furthermore, Bist et al. (2019) found that leverage and credit to core capital plus deposit ratio are positively correlated to return on assets which indicates that increase in the liquidity ratio will leads to increase in the return on assets.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of credit management on the performance of 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 main purpose of the study is to analyze the impact of credit management on the performance of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, non-

performing loan, credit risk, client appraisal, collection policy and credit terms with return on asset 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 the conclusion.

## 2. Methodological aspects

The study is based on both primary and secondary data. The primary data were collected from 120 respondents and secondary data were gathered from 26 Nepalese commercial banks from 2013/14 to 2020/21, leading to a total of 128 observations. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks 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 |
|-------------------------------------|-------------------------------------|-------------------|--------------|
| <b>Public Banks</b>                 |                                     |                   |              |
| 1                                   | Rastriya Banijya Bank Limited       | 2013/14 - 2020/21 | 8            |
| 2                                   | Nepal Bank Limited                  | 2013/14 - 2020/21 | 8            |
| <b>Joint Venture Banks</b>          |                                     |                   |              |
| 3                                   | Nabil Bank Limited                  | 2013/14 - 2020/21 | 8            |
| 4                                   | NMB Bank Limited                    | 2013/14 - 2020/21 | 8            |
| 5                                   | Himalayan Bank Limited              | 2013/14 - 2020/21 | 8            |
| 6                                   | Everest Bank Limited                | 2013/14 - 2020/21 | 8            |
| <b>Private Banks</b>                |                                     |                   |              |
| 7                                   | NIC Asia Bank Limited               | 2013/14 - 2020/21 | 8            |
| 8                                   | Global IME Bank Limited             | 2013/14 - 2020/21 | 8            |
| 9                                   | Siddhartha Bank Limited             | 2013/14 - 2020/21 | 8            |
| 10                                  | Nepal Investment Bank Limited       | 2013/14 - 2020/21 | 8            |
| 11                                  | Prabhu Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 12                                  | Kumari Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 13                                  | Prime Commercial Bank Limited       | 2013/14 - 2020/21 | 8            |
| 14                                  | Sanima Bank Limited                 | 2013/14 - 2020/21 | 8            |
| 15                                  | Mega Bank Nepal Limited             | 2013/14 - 2020/21 | 8            |
| 16                                  | Citizens Bank International Limited | 2013/14 - 2020/21 | 8            |
| <b>Total number of observations</b> |                                     |                   | <b>128</b>   |

Thus, the study is based on the 128 observations.

## The model

The model used in this study assumes that profitability depends on credit risk management. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables in this study are credit terms, client appraisal, collection policy, credit risk, capital adequacy ratio and non-performing loan. The following model equations are designed to test the hypothesis.

$$ROA = \beta_0 + \beta_1 CR + \beta_2 CA + \beta_3 CP + \beta_4 CT + \beta_5 CAR + \beta_6 NPL + \varepsilon_{it}$$

$$ROE = \beta_0 + \beta_1 CR + \beta_2 CA + \beta_3 CP + \beta_4 CT + \beta_5 CAR + \beta_6 NPL + \varepsilon_{it}$$

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.

CR = Credit risk

CA = Client appraisal

CP = Collection policy

CT = Credit terms

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

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

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

Credit risk 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 "Imposing loan size limits is a viable strategy in credit risk," "Penalty for late payment enhances customer's commitment to loan repayment" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.778$ ).

Client appraisal 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 "Client appraisal considers the character and capacity of the customers seeking credit facilities" "Failure to assess customer's capacity to repay results in loan defaults" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.761$ ).

Collection policy 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 "Implementation of guaranteed policies gives a chance to recover loan in case in the instance of defaulters," "A strict and regular review of policy is effective in recovery of debt compared to a moderate policy" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.777$ ).

Credit term 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 "Credit terms are evaluated by the looking at capital position," "Credit terms specify the credit period given to customers" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.771$ ).

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

## Non-performing loan

The size of non-performing loans (NPLs) plays a key role in the stability of the banking sector of a country. The factors that explain the NPLs contain very important information for banks. Khan et al. (2020) examined the determinants of NPLs observing a case of the banking sector in Pakistan over the period from 2005 to 2017. The results showed that the operating efficiency and profitability indicators have a negative association with NPLs but were statistically significant. In addition, Gizaw (2015) investigated that non-performing loan (NPL) is a major indicator of the credit risk of a commercial bank. The study found that NPL which measures the extent of credit default risk sustained by the banks has negative effect on profitability measurement. Likewise, Messai and Jouini (2013) examined the micro and macro determinants of non-performing loans. The study found a negative association between nonperforming loans and return on assets. Similarly, Akter and Roy (2017) assessed the impacts of non-performing loan on profitability of banking sector of Dhaka Stock Exchange. The study found that non-performing loan has negative effect on net interest margin and return on assets. Based on it, this study develops the following hypothesis.

H<sub>1</sub>: There is a negative relationship between the non-performing loan and bank performance.

## Capital adequacy ratio

Capital adequacy refers to the amount of equity capital and other securities which a bank holds as reserves against risky assets as a hedge against the probability of bank failure. Agbeja et al. (2015) examined the relationship between capital adequacy ratio and bank profitability in Nigeria using linear approach. The study showed that there is a positive and significant relationship between capital adequacy ratio and bank's profitability indicating that banks with more equity capital are perceived to have more safety and such advantage can be translated into higher profitability. Similarly, Bateni et al. (2014) found that bank profitability has a significant positive relationship with capital adequacy ratio in Iranian banks. Similarly, Shabani et al. (2019) explored the effects of capital adequacy on the return of assets to the banking sector in Kosov. The study concluded that capital adequacy has a positive impact on asset returns and has a significant relationship. Likewise, Khalid et al. (2021) found that there is a positive relationship between the banks' financial performance and capital adequacy ratio. In addition, Ogboi and Unuafé (2013) assessed the impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria. The study showed that credit risk management and capital adequacy ratio have positive impact on financial performance. Based on it, this study develops the following hypothesis.

H<sub>2</sub>: There is a positive relationship between capital adequacy ratio and bank performance.

## Credit risk

Credit risk is the risk of default emerging from an inability to comply with the payments of borrowers or obligors. Sharifi et al. (2021) examined the relationship between credit risk management, size, profitability, and ownership of Indian banks. The results showed that size of Indian banks is related to excess capital

held by them for managing credit risk. Similarly, the result also showed a negative relationship between credit risk and bank profitability. Biswas et al. (2021) found a negative effect of credit risk on commercial banks' profitability in Bangladesh. Moreover, Al-Husainy and Jadah (2021) revealed that there is a significant negative effect of liquidity risk and credit risk on the bank performance in the context of Iraq. Furthermore, Abdelaziz et al. (2022) analyzed the interactional relationships between credit risk, liquidity risk and bank profitability in MENA region. The study found a negative relationship between credit risk, liquidity risk and bank profitability. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a negative relationship between credit risk and bank performance.

## **Client appraisal**

Olabamiji and Michael (2018) examined the influence of credit management practices on financial performance of Nigerian banks with specific reference to First bank Plc. The result revealed that credit management practices have a significant positive influence on the financial performance of First bank. The result concluded that client appraisal, credit risk control, and collection policy are major predictors of financial performance of First bank. Catherine (2019) assessed the association between credit risk management and financial performance of Bank of Africa (U) Limited. The study found that client appraisal, credit risk control, and collection policy have significant positive effect on bank profitability. Moreover, Ogunlade and Oseni (2018) showed that credit management practices (client appraisal, credit risk, and collection policy) have a significant positive influence on the financial performance. Likewise, Kiplimo and Kalio (2012) found that there is a strong relationship between client appraisals and loan performance in MFIs. The result showed that better client appraisal system led to an increase in loan performance in MFIs in Baringo County. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between client appraisal and bank performance.

## **Credit terms**

Ahmed and Malik (2015) showed that the credit terms and client appraisal have positive and significant impact on the loan performance. Lunalo et al. (2019) revealed that credit risk, credit policy, account receivables and credit term have significant and positive effect on financial performance of transport firms in Mombasa County. Similarly, Mot et al. (2012) explored that credit terms have significant positive impact on loan performance of MFIs in Kenya. Claude and Edsion (2018) concluded that credit terms and collection policy are statistically significant and have positive relationship with loan performance. Moreover, Jibrin et al. (2013) revealed that there is a positive correlation between credit policy, credit terms and profitability. In addition, Muturi et al. (2016) found that credit collection policies and terms of credit has positive effect on the performance of the institutions. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between credit term and bank performance.

## **Collection policy**

Warue (2012) discovered that debt collection policies have a positive and significant effect on loan delinquency and overall microfinance performance. Likewise, Kipkirui and Omagwa (2018) explored that



collection policy has statistically significant positive relationship with financial performance. Reicheld and Sasser (2010) revealed that collection activities are aimed at accelerating recovery from slow payers and minimizing bad debt losses. The study showed that collection policy has a significant positive effect on financial performance. A stringent policy is more effective in debt recovery than a lenient policy. Likewise, Gizaw (2015) opined that effective collection policies have a favorable and significant impact on better organization's financial performance. Furthermore, Kagoyire and Shukla, (2016) discovered a positive relationship between commercial bank financial performance of commercial banks in Rwanda and collection policy. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between collection policy and bank performance.

### 3. Results and discussion

#### Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2020/21.

**Table 2:** Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. 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 shareholder's equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets, in percentage), NPL (Nonperforming loan as measured by the ratio of non-performing loan to total loan, in percentage), CA (Client appraisal), CP (Collection policy), CR (Credit risk) and CT (Credit term).

| Variables | Minimum | Maximum | Mean  | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| ROA       | 0.55    | 2.89    | 1.62  | 0.45           |
| ROE       | 7.57    | 55.31   | 18.00 | 6.49           |
| CAR       | 4.55    | 17.91   | 12.83 | 1.95           |
| NPL       | 0.01    | 24.29   | 1.94  | 2.49           |
| CR        | 1.67    | 5.00    | 4.07  | 0.54           |
| CA        | 1.60    | 5.00    | 4.01  | 0.58           |
| CT        | 1.60    | 5.00    | 3.99  | 0.53           |
| CP        | 1.40    | 5.00    | 4.11  | 0.53           |

Source: SPSS output

#### Correlation analysis

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

**Table 3: Pearson's correlation coefficients matrix**

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2013/14 to 2020/21. 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 shareholder's equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets, in percentage), NPL (Nonperforming loan as measured by the ratio of non-performing loan to total loan, in percentage), CA (Client appraisal), CP (Collection policy), CR (Credit risk) and CT (Credit term).

| Variables | ROA     | ROE    | CAR    | NPL   | CR      | CA      | CT      | CP |
|-----------|---------|--------|--------|-------|---------|---------|---------|----|
| ROA       | 1       |        |        |       |         |         |         |    |
| ROE       | 0.443** | 1      |        |       |         |         |         |    |
| CAR       | 0.032   | 0.396  | 1      |       |         |         |         |    |
| NPL       | -0.078  | -0.128 | -0.373 | 1     |         |         |         |    |
| CR        | -0.089  | -0.037 | 0.060  | 0.025 | 1       |         |         |    |
| CA        | 0.014   | 0.107  | 0.017  | 0.042 | 0.753** | 1       |         |    |
| CT        | 0.077   | 0.036  | -0.018 | 0.087 | 0.663** | 0.630** | 1       |    |
| CP        | 0.023   | 0.038  | -0.022 | 0.115 | 0.679** | 0.645** | 0.734** | 1  |

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

Table 3 shows that the capital adequacy ratio is positively correlated to return on assets. It means that an increase in capital adequacy ratio leads to increase in return on assets. Similarly, there is a negative relationship between the non-performing loan and the return on assets. It means that an increase in non-performing loans leads to a decrease in return on assets. Moreover, credit risk has a negative relationship with return on assets. It means that increase in credit risk leads to decrease in return on assets. Furthermore, there is a positive relationship between the client appraisal and return on assets. It indicates that better client appraisal leads to an increase in return on assets. Similarly, there is a positive relationship between credit terms and return on assets. It means that greater credit terms lead to an increase in return on assets. Likewise, collection policy has a positive relationship with return on assets. It means that a better collection policy leads to an increase in return on assets in Nepalese commercial banks.

Similarly, the result also shows that capital adequacy ratio is positively correlated to return on equity. It means that an increase in capital adequacy ratio leads to increase in return on equity. Similarly, there is a negative relationship between the non-performing loan and the return on equity. It means that an increase in non-performing loans leads to a decrease in return on equity. Moreover, credit risk has a negative relationship with return on equity. It means that increase in credit risk leads to decrease in return on equity. Furthermore, there is a positive relationship between the client appraisal and return on equity. It indicates that better client appraisal leads to an increase in return on equity. Similarly, there is a positive relationship between credit terms and return on equity. It means that greater credit terms lead to an increase in return on equity. Likewise, collection policy has a positive relationship with return on equity. It means that a better collection policy leads to an increase in return on equity in Nepalese commercial banks.

## Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4. More specifically, it shows the regression results of capital adequacy ratio, non-performing loan, credit risk, credit term, collection policy, and client appraisal on return on assets of Nepalese commercial banks.

**Table 0:** Estimated regression results of capital adequacy ratio, non-performing loan, credit risk, credit term, collection policy and client appraisal on return on assets

The results are based on 16 commercial banks with 128 observations for the period of 2013/14-2020/21 using a linear regression model. The model is  $ROA = \beta_0 + \beta_1 CR + \beta_2 CA + \beta_3 CP + \beta_4 CT + \beta_5 CAR + \beta_6 NPL + \varepsilon_i$  where the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets, in percentage), NPL (Nonperforming loan as measured by the ratio of non-performing loan to total loan, in percentage), CA (Client appraisal), CP (Collection policy), CR (Credit risk) and CT (Credit term).

| Models | Intercepts          | Regression coefficients of |                   |                    |                  |                  |                  | Adj.R_<br>bar <sup>2</sup> | SEE   | F-val-<br>ue |
|--------|---------------------|----------------------------|-------------------|--------------------|------------------|------------------|------------------|----------------------------|-------|--------------|
|        |                     | CAR                        | NPL               | CR                 | CA               | CT               | CP               |                            |       |              |
| 1      | 1.723<br>(6.385)**  | 0.007<br>(0.358)           |                   |                    |                  |                  |                  | 0.007                      | 0.458 | 0.128        |
| 2      | 1.655<br>(32.273)** |                            | -0.014<br>(0.880) |                    |                  |                  |                  | 0.002                      | 0.456 | 0.775        |
| 3      | 1.343<br>(4.584)**  |                            |                   | -0.069<br>(0.966)  |                  |                  |                  | 0.001                      | 0.422 | 0.933        |
| 4      | 1.584<br>(5.843)**  |                            |                   |                    | 0.010<br>(0.148) |                  |                  | 0.008                      | 0.424 | 0.022        |
| 5      | 1.382<br>(4.732)**  |                            |                   |                    |                  | 0.066<br>(0.834) |                  | 0.003                      | 0.423 | 0.695        |
| 6      | 1.549<br>(5.147)**  |                            |                   |                    |                  |                  | 0.018<br>(0.250) | 0.008                      | 0.424 | 0.062        |
| 7      | 1.878<br>(6.166)**  | 0.017<br>(0.740)           | -0.019<br>(1.092) |                    |                  |                  |                  | 0.005                      | 0.457 | 0.660        |
| 8      | 1.408<br>(4.655)**  |                            |                   | -0.140<br>(1.296)  | 0.089<br>(0.878) |                  |                  | 0.003                      | 0.423 | 0.851        |
| 9      | 1.934<br>(4.510)**  | 0.046<br>(1.816)           | -0.026<br>(1.554) | -0.080<br>(1.132)  |                  |                  |                  | 0.017                      | 0.418 | 1.693        |
| 10     | 2.168<br>(5.105)**  | 0.044<br>(1.734)           | -0.025<br>(1.500) |                    | 0.017<br>(0.249) |                  |                  | 0.007                      | 0.421 | 1.274        |
| 11     | 2.009<br>(4.598)**  | 0.047<br>(1.843)           | -0.025<br>(1.536) | -0.154<br>(1.432)  | 0.092<br>(0.913) |                  |                  | 0.016                      | 0.419 | 1.477        |
| 12     | 1.944<br>(4.268)**  | 0.046<br>(1.816)           | -0.026<br>(1.562) | -0.132<br>(1.129)  | 0.106<br>(1.017) | 0.053<br>(0.525) |                  | 0.010                      | 0.420 | 1.229        |
| 13     | 1.990<br>(4.292)**  | 0.046<br>(1.818)           | -0.025<br>(1.502) | -0.248<br>(2.231)* | 0.096<br>(0.900) | 0.084<br>(0.734) | 0.067<br>(0.577) | 0.104                      | 0.381 | 6.074        |

**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 Shabani et al. (2019). However, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is similar to the findings of Akter and Roy (2017). Similarly, the beta coefficients for credit risk are negative with return on assets. It indicates that credit risk has a negative impact on return on assets. This finding is consistent with the findings of Biswas et al. (2021). Similarly, the

beta coefficients for client appraisal are positive with return on assets. It indicates that has client appraisal has a positive impact on return on assets. This finding is similar to the findings of Ogunlade and Oseni (2018). Likewise, the beta coefficients for collection policy are positive with return on assets. It indicates that collection policy has a positive impact on return on assets. This finding is consistent with the findings of Kipkirui and Omagwa (2018). Likewise, the beta coefficients for credit terms are positive with return on assets which indicates that credit term has a positive impact on return on assets. This finding is consistent with the findings of Jibrin et al. (2013).

Table 5 shows the estimated regression results of capital adequacy ratio, non-performing loan, credit risk, client appraisal, credit term, collection policy on return on equity of Nepalese commercial banks.

**Table 5:** Estimated regression results of capital adequacy ratio, non-performing loan, credit risk, client appraisal, credit term and collection policy return on equity

The results are based on 16 commercial banks with 128 observations for the period of 2013/14-2020/21 using a linear regression model. The model is  $ROE = \beta_0 + \beta_1 CR + \beta_2 CA + \beta_3 CP + \beta_4 CT + \beta_5 CAR + \beta_6 NPL + \varepsilon_t$  where the dependent variable is ROE (Return on equity as measured by the ratio of net income to shareholder's equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total assets, in percentage), NPL (Nonperforming loan as measured by the ratio of non-performing loan to total loan, in percentage), CA (Client appraisal), CP (Collection policy), CR (Credit risk) and CT (Credit term).

| Models | Intercepts           | Regression coefficients of |                   |                   |                  |                  |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|--------|----------------------|----------------------------|-------------------|-------------------|------------------|------------------|------------------|-------------------------|-------|---------|
|        |                      | CAR                        | NPL               | CR                | CA               | CT               | CP               |                         |       |         |
| 1      | 34.878<br>(9.885)**  | 1.315<br>(4.838)**         |                   |                   |                  |                  |                  | 0.150                   | 5.989 | 23.407  |
| 2      | 17.353<br>(23.897)** |                            | -0.333<br>(1.448) |                   |                  |                  |                  | 0.009                   | 6.469 | 2.098   |
| 3      | 19.834<br>(4.775)**  |                            |                   | -0.412<br>(0.407) |                  |                  |                  | 0.007                   | 5.993 | 0.166   |
| 4      | 22.555<br>(5.921)**  |                            |                   |                   | 1.094<br>(1.166) |                  |                  | 0.003                   | 5.963 | 1.361   |
| 5      | 19.781<br>(4.781)**  |                            |                   |                   |                  | 0.407<br>(0.396) |                  | 0.007                   | 5.993 | 0.157   |
| 6      | 19.895<br>(4.680)**  |                            |                   |                   |                  |                  | 0.422<br>(0.412) | 0.007                   | 5.993 | 0.170   |
| 7      | 35.361<br>(8.842)**  | 1.343<br>(4.569)**         | -0.060<br>(0.260) |                   |                  |                  |                  | 0.144                   | 6.012 | 11.651  |
| 8      | 21.192<br>(4.962)**  |                            |                   | -1.088<br>(0.711) | 1.859<br>(1.301) |                  |                  | 0.001                   | 5.975 | 0.930   |
| 9      | 36.319<br>(6.337)**  | 1.359<br>(4.031)**         | -0.002<br>(0.009) | -0.163<br>(0.172) |                  |                  |                  | 0.121                   | 5.598 | 6.464   |
| 10     | 39.648<br>(7.064)**  | 1.349<br>(4.034)**         | -0.010<br>(0.044) |                   | 1.031<br>(1.175) |                  |                  | 0.131                   | 5.566 | 6.990   |
| 11     | 38.059<br>(6.564)**  | 1.376<br>(4.106)**         | -0.005<br>(0.021) | -1.545<br>(1.081) | 2.113<br>(1.588) |                  |                  | 0.132                   | 5.562 | 5.542   |
| 12     | 38.238<br>(6.320)**  | -1.377<br>(.089)**         | -0.006<br>(0.028) | -1.607<br>(1.039) | 2.073<br>(1.496) | 0.145<br>(0.109) |                  | 0.125                   | 5.586 | 4.398   |
| 13     | 38.356<br>(6.219)**  | 1.378<br>(4.072)**         | -0.008<br>(0.038) | -1.649<br>(1.032) | 2.047<br>(1.449) | 0.066<br>(0.043) | 0.173<br>(0.111) | 0.117                   | 5.610 | 3.635   |

**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 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 Agbeja et al. (2015). However, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is similar to the findings of Gizaw (2015). Similarly, the beta coefficients for credit risk are negative with return on equity. It indicates that credit risk has a negative impact on return on equity. This finding is consistent with the findings of Al-Husainy and Jadah (2021). Similarly, the beta coefficients for client appraisal are positive with return on equity. It indicates that has client appraisal has a positive impact on return on equity. This finding is similar to the findings of Kiplimo and Kalio (2012). Likewise, the beta coefficients for collection policy are positive with return on equity. It indicates that collection policy has a positive impact on return on equity. This finding is consistent with the findings of Warue (2012). Likewise, the beta coefficients for credit terms are positive with return on equity which indicates that credit term has a positive impact on return on assets. This finding is consistent with the findings of Lunalo et al. (2019).

## 4. Summary and conclusion

Sound financial health of a bank is the guarantee not only to its depositors but is equally significant for the shareholders, employees and whole economy as well. Credit management systems aimed at ensuring efficient collection of loans made to clients in order to minimize credit risk. Credit risk management has been an integral part of the loan process in banking business. Credit risk is the current and prospective risk to earnings or capital arising from an obligor's failure to meet the terms of any contract with the bank. Credit risk hinders bank from achieving their set targets.

This study attempts to analyze the effect of credit management on the performance of Nepalese commercial banks. The study is based on both primary data and secondary data of 16 commercial banks with 128 observations for the period from 2013/14 to 2020/21.

The study showed that capital adequacy ratio, client appraisal, credit term and collection policy have positive impact on return on assets and return on equity. However, non-performing loan and credit have negative impact on return on assets and return on equity. The study concluded that credit risk is the most influencing factor that explains the changes in bank performance in terms of return on assets. Likewise, the study also concluded that the most dominant factor that determines the return on equity is capital adequacy ratio in the context of Nepalese commercial banks.

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PART 5

# Market



## Abstract

*This study examines the impact of digital marketing on consumer behavior in Kathmandu Valley. Consumer behavior is the dependent variable. The selected independent variables are digital advertising, social media marketing, mobile marketing, email marketing and product/service reviews. The primary source of data is used to assess the opinions of the respondents regarding impact of digital marketing on consumer behavior in Kathmandu Valley. The study is based on primary data with 211 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 digital marketing on consumer behavior in Kathmandu Valley.*

*The study showed that digital advertising has a positive impact on consumer behavior. It implies that better digital advertising stimulates the buying behavior of the consumer. The result also revealed that social media marketing has a positive impact on consumer behavior. It implies that better social media marketing stimulates the buying behavior of the consumer. Moreover, mobile marketing has a positive impact on consumer behavior indicating that better mobile marketing, stimulates the buying behavior of the consumer. Furthermore, email marketing has a positive impact on consumer behavior indicating that better email marketing stimulates the buying behavior of the consumer. Similarly, the result also showed that product/service reviews have a positive impact on consumer behavior. It indicates that positive product/service reviews stimulate the buying behavior of the consumer.*

**Keywords:** Digital advertising, social media marketing, mobile marketing, email marketing and product/service reviews and consumers behavior.

# 1. Introduction

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 (Al-Qaysi and Al-Emran, 2017). These technological advancements make the world look like a small village as these communication media are able to facilitate access and interaction with consumers (Malik and Al-Emran, 2018). 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 (Ghazie and Dolah, 2018).

Digital marketing is the process of adopting internet based promotional activities by the marketers, by utilizing electronic media to sell their goods and services. It offers new opportunities for the marketers to interact directly anytime with the customers. It also paves the way for large, medium and small-scale businesses to market their products efficiently and to have direct contact with the customers (Ramesh and Vidhya, 2019). Digital marketing is a broad marketing concept that describes the marketing of products or services using digital technologies, mainly on the Internet, but also includes display advertising, mobile phones, and any other digital medium. Digital marketing is the promotion of products or brands through one or more forms of electronic media and it differs from conventional marketing (Yamin, 2017). 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, Pitt, and Campbell 2008). Social media platforms offer an opportunity for customers to interact with other consumers; thus, companies are no longer the sole source of brand communication (Li and Bernoff 2011). Consumer behavior is the representation of those people who are directly involved in making the decision regarding the use of good and the services. Consumer behavior is related to the intention towards sale and purchase of any product or the services that satisfy their needs and wants. (Saleem and Abideen, 2011). Mihart (2012) defined consumer behavior as the decision making behavioral that requires understanding towards the purchase of the product. Consumer behavior is based on the decision process that depends on the acts of the individuals. According to Nabieva (2021), consumer behavior is based on the psychological factors, social, personal and the cultural factors. Kotler and Keller (2012) defined consumer behavior as the study of how individuals, organizations and group of select, buy and make use of products, services, experiences or ideas to satisfy their need and wants. According to Aziz et al. (2021), consumer behavior refers to the selection, purchase and consumption of goods and services for the satisfaction of their wants.

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).

Digital marketing campaigns are becoming more predominant and efficient as digital platforms are progressively integrated into marketing plans and daily life. Digital marketing aids marketers to reach their products for users through several channels such as e-mail marketing, online advertising, social media marketing, mobile marketing, etc. (Rao and Ratnamadhuri., 2018). E-mail marketing is one of the digital marketing methods used to distribute orders or target letters to the same individuals at a suitable time. With email, businesses can send emails that meet customers' needs (Ugonna et al., 2017). Besides, email marketing is a type of direct marketing that uses email to message or communicate promoting funds to connect audiences (Lodhi, and Shoaib, 2017). Online advertising is a form of promotion that convinces customers to make purchasing decisions and provides information to the audience. When the information is offered in a pleasant context, the information is easily accepted (Mishra and Mahalik, 2017). Similarly, online advertising marketing is a strategy that utilizes the internet to get website traffic and deliver marketing letters to the right potential consumers (Budiman, 2021). The most significant advantage of online advertising is the promotion of products without geographical borders (Khan and Islam, 2017). Thus, online advertising is a very vital portion of digital marketing. Mobile marketing is considered one of the latest and most important digital marketing channels. Therefore, mobile marketing today is the broadest, fastest, cheapest, and most actual marketing channel where users can earn information and features of attractive goods easily with the possibility of completing the buying and selling process without the need for the buyer to go to the place of goods (Alam et al., 2015). Specifically, mobile marketing provides access to consumers to know their benefits and needs and influence their purchasing decisions (Tiffany et al., 2018). On the other hand, mobile marketing is a group of practices that allow firms to communicate and interact with their audiences interactively and relevantly through any device or mobile network (Mohamed et al., 2016). Finally, mobile marketing has emerged as one of the exciting interactive communication mode channels between firms and customers.

In the context of Nepal, Rana (2016) found that consumers are less concern about the brand image while making a purchase decision. The findings also revealed that people are more influenced by word of mouth and opinion given by the people they know on Facebook and it substantially affects their buying behavior. The least effective Facebook marketing factor is celebrity endorsement which implicates that consumer are more affected by views of friends and family rather than endorsement done by celebrities. With the popularity of the internet, several internet or e-commerce-based organizations such as e-banking, e-shopping and e-education are flourishing in the market. Daraz, Sasto deal, eSewa Pasal, Metro Tarkari, Bhatbhateni Online, Mero Kirana, Foodmario, Foodmandu, and Urban Girl are some of the popular e-businesses of Nepal. With the increasing rate of e-business, online adverting has gained momentum in the Nepali e-commerce platforms. Devkota et al. (2021) investigated attitude towards online advertising in Kathmandu Valley. The study found that good quality elements of advertisement have a significant influence on attitudes toward online advertising in online platforms. The findings suggested that good for the economy and quality elements of online advertising have a significant influence on attitudes toward online advertisements.



The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of digital marketing on consumer behavior. 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 impact of digital marketing on consumer behavior in Kathmandu Valley. More specifically, it examines the impact of digital advertising, social media marketing, mobile marketing, email marketing and product/service reviews on consumer behavior 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 were gathered from 211 respondents through questionnaire. The respondents' views were collected on digital advertising, social media marketing, mobile marketing, emails marketing and product/service reviews. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that consumer behavior depends on digital advertising, social media marketing, mobile marketing, emails marketing and product/service reviews. Therefore, the model takes the following form:

$$CB = \beta_0 + \beta_1 DA + \beta_2 SSM + \beta_3 MM + \beta_4 EM + \beta_5 PSR + e$$

Where,

|     |   |                        |
|-----|---|------------------------|
| CB  | = | Consumer behavior      |
| DA  | = | Digital advertising    |
| SSM | = | Social media marketing |
| MM  | = | Mobile marketing       |
| EM  | = | Email marketing        |
| PSR | = | Product/service review |

Digital advertising 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 "Generally, I like ads that I see on the internet", "I want to try products/services by seeing ad created by the sponsor company" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.869$ ).

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 "Social media marketing are valuable source of product/service information", "Social media marketing are convenient source of product/service information" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.826$ ).

Mobile 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 would prefer companies to contact me on my mobile phone rather than email or post”, “I prefer SMS reminders of product/services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.835$ ).

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 “I like receiving emails from companies about product and services”, “Email marketing provides detail information about the product and services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.866$ ).

Product/service review 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 go through product/service review sites on social media while making decisions”, “Product/service review helps to choose correct product or services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.795$ ).

Consumer 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 “Digital marketing influence my consumption behavior”, “I rely on digital marketing activities for product and service information” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.768$ ).

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

## Digital advertising

Digital advertising is a marketing communication effort made by marketers in promoting products or service agents through digital channels (Yang et al., 2018). According to Alamsyah et al. (2021), consumer behavior and digital advertising have positive relationship when consumer gets engaged in digital platform. Similarly, Saleem and Abideen (2011) defined digital advertising as communications regarding products, services, or ideas through digital media. The study found that companies which include not only traditional online media, but also interactive media such as digital signage, smartphone, or virtual reality platforms influence the consumer behavior directly. According to Tobi et al. (2020), digital advertisements are becoming more attractive as marketing communication tools for reaching targeted customers in a variety of methods and places. Digital advertising has a significant positive relationship with consumer behavior as video, animation, and music has major impact on individual’s behavior (Gilaninia et al., 2013). Based on it, the study develops following hypothesis:

H<sub>1</sub>: There is a positive relationship between digital advertising and consumer behavior.

## Social media marketing

Social media influences consumer advertising perceptions, brand attitudes, and buying intentions. Furthermore, social media could create brand attitudes that influence consumer behavior. The brand

or product's good image will lead the customer to make a decision on their purchases (Schivinski and Dabrowski, 2016). Putter (2017) highlighted that consumer buying behaviors are not simply influenced by traditional channels, but social media plays an important role in the process of consumer buying behavior, which is now heavily affected by peer reviews, social networks, blogs, etc. Jacinto et al. (2021) evaluated the influence of social media marketing on consumer buying behavior, particularly among Panabo City citizens who mostly use social media websites to purchase products and services. The result shows that there is a positive, moderate, and significant correlation between social media marketing and consumer buying behavior. Based on it, the study develops following hypothesis:

H<sub>2</sub>: There is a positive relationship between social media marketing and consumer behavior.

## Mobile marketing

Mobile marketing is act as a phenomenon of great impact and relevance for marketing communications because it provides a continuous access to the consumer anytime and anywhere. Shahina and Sachitra (2021) examined the influence of innovative mobile marketing services on customer attitudes and buying behaviours of young consumers in Sri-Lanka. The results revealed statistically significant relationships between mobile marketing initiatives (mobile app marketing and SMS marketing) and customer buying behaviour. Similarly, Scharl et al. (2005) referred mobile marketing as use of wireless medium to provide consumers with personalized information that promotes goods, services and ideas, thereby benefiting all stakeholders. According to Kim et al. (2013), mobile advertising can also be used to drive consumers to mobile commerce enabled sites, which will further enhance a positive connection with preferred brands. Based on it, the study develops following hypothesis:

H<sub>3</sub>: There is a positive relationship between mobile marketing and consumer behavior.

## Email marketing

According to Kumar (2014), email marketing adopts emails as the medium for marketing communication between people who promote or exchange product and service for money, and people who receive the marketing emails. According to Pavlov et al. (2008), email marketing strategy is constructed by different email campaigns. Email has become an important part of companies' marketing mix and is considered as the most successful form of communication technology, carrying the potential to boost marketing success, to improve the brand image and stimulate consumer buying behavior (Tezinde et al., 2002). Similarly, Omar and Atteya (2020) defined e-mail marketing as a kind of direct marketing that utilizes e-mail as a means of communication or fund-promoting messages to link the viewers. The study also showed that digital marketing and marketing through email have positive influence on the customer purchasing behavior. Chang et al. (2013) examined the email advertising effectiveness and investigated differences between permission-based email and spamming. The results indicated that values and attitudes toward, and the perceived intrusiveness of, email advertising significantly affect consumers' behavioral dispositions toward email advertising. Based on it, the study develops following hypothesis:

H<sub>4</sub>: There is a positive relationship between email marketing and consumer behavior.

## Product/service review

According to Vana and Lambrecht (2021), online product reviews constitute a powerful source of information for consumers. The study showed that individual reviews displayed on a product web page positively affect consumers' purchase likelihood. According to Floyd et al. (2014), consumer reviews on online decisions is widely recognized and has positive effect on buying intention. In general, more positive reviews increase sales and attitudes, whereas negative reviews reduce them. Their effect, however, also depends on review exposure, the characteristics of the reviewer, and the source of the review. Ziegele and Weber (2015) suggested that younger adults' behaviors are strongly influenced by average consumer ratings. Average ratings of a product, however, may lose their influence on decisions if they are inconsistent with a well-written. Changchit and Klaus (2020) found that online reviews positively affect consumers' perceptions and purchase decisions Based on it, the study develops following hypothesis:

H<sub>5</sub>: There is a positive relationship between product/service review and consumer behavior.

## 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 correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 221 observations. The dependent variable is CB (Consumer behavior). The independent variables are DA (Digital advertising), SMM (Social media marketing), MM (Mobile marketing), EM (Email marketing), and PSR (Product/service review).

| Variables | Mean  | SD    | CB      | DA      | SMM     | MM      | EM      | PSR |
|-----------|-------|-------|---------|---------|---------|---------|---------|-----|
| CB        | 3.740 | 0.726 | 1       |         |         |         |         |     |
| DA        | 3.880 | 0.919 | 0.475** | 1       |         |         |         |     |
| SMM       | 3.473 | 0.787 | 0.532** | 0.502** | 1       |         |         |     |
| MM        | 3.467 | 0.897 | 0.449** | 0.448** | 0.413** | 1       |         |     |
| EM        | 3.844 | 0.929 | 0.527** | 0.458** | 0.416** | 0.502** | 1       |     |
| PSR       | 3.617 | 0.772 | 0.600** | 0.470** | 0.613** | 0.432** | 0.422** | 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 advertising is positively correlated to consumer behavior. It implies that better digital advertising stimulates the buying behavior of the consumer. The result also reveals that social media marketing is positively correlated to consumer behavior. It implies that better social media marketing stimulates the buying behavior of the consumer. Moreover, mobile marketing is positively correlated to consumer behavior indicating that better mobile marketing, stimulates the buying behavior of the consumer. Furthermore, email marketing is positively correlated to consumer behavior indicating that better email marketing stimulates the buying behavior of the consumer. Similarly, the result also shows that

product/service reviews are positively correlated to consumer behavior. It indicates that positive product/service reviews stimulate the buying behavior of the consumer.

## 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 digital advertising, social media marketing, mobile marketing, email marketing and product/service review on consumer behavior.

**Table 2:** Estimated regression results of digital advertising, social media marketing, mobile marketing, email marketing and product/service review on consumer behavior

The results are based on 221 observations using linear regression model. The model is  $CB = \beta_0 + \beta_1 DA + \beta_2 SSM + \beta_3 MM + \beta_4 EM + \beta_5 PSR + e$ , where dependent variable is CB (Consumer behavior). The independent variables are DA (Digital advertising), SMM (Social media marketing), MM (Mobile marketing), EM (Email marketing), and PSR (Product/service review).

| Model | Intercept           | Regression coefficients of |                     |                    |                     |                     | Adj. R_bar <sup>2</sup> | SEE   | F- value |
|-------|---------------------|----------------------------|---------------------|--------------------|---------------------|---------------------|-------------------------|-------|----------|
|       |                     | DA                         | SMM                 | MM                 | EM                  | PSR                 |                         |       |          |
| 1     | 0.266<br>(10.939)** | 0.417<br>(9.190)**         |                     |                    |                     |                     | 0.275                   | 0.618 | 84.448   |
| 2     | 1.042<br>(9.080)**  |                            | 0.558<br>(11.263)** |                    |                     |                     | 0.364                   | 0.579 | 126.852  |
| 3     | 1.149<br>(9.300)**  |                            |                     | 0.438<br>(9.522)** |                     |                     | 0.290                   | 0.612 | 90.661   |
| 4     | 0.988<br>(9.076)**  |                            |                     |                    | 0.503<br>(12.440)** |                     | 0.411                   | 0.557 | 154.76   |
| 5     | 0.822<br>(7.765)**  |                            |                     |                    |                     | 0.655<br>(14.382)** | 0.483                   | 0.522 | 206.831  |
| 6     | 0.887<br>(7.338)**  | 0.199<br>(3.829)**         | 0.417<br>(6.868)**  |                    |                     |                     | 0.401                   | 0.562 | 74.717   |
| 7     | 0.887<br>(7.338)**  | 0.115<br>(2.113)*          | 0.353<br>(5.804)**  | 0.209<br>(4.033)** |                     |                     | 0.440                   | 0.543 | 58.717   |
| 8     | 0.528<br>(4.470)**  | 0.051<br>(0.988)           | 0.298<br>(5.246)**  | 0.298<br>(1.453)   | 0.303<br>(6.168)**  |                     | 0.522                   | 0.502 | 61.064   |
| 9     | 0.433<br>(3.868)**  | 0.024<br>(0.490)           | 0.81<br>(1.217)     | 0.055<br>(1.107)   | 0.250<br>(5.302)*   | 0.376<br>(5.549)**  | 0.580                   | 0.470 | 61.747   |
| 10    | 0.439<br>(3.940)**  |                            | 0.089<br>(1.393)    | 0.061<br>(1.271)   | 0.254<br>(5.485)**  | 0.379<br>(5.637)**  | 0.581                   | 0.469 | 77.396   |
| 11    | 0.464<br>(4.217)**  |                            |                     | 0.072<br>(1.529)   | 0.257<br>(5.548)**  | 0.439<br>(8.523)**  | 0.580                   | 0.470 | 102.104  |

### Notes:

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

The regression results show that the beta coefficients for digital advertising are positive with consumer behavior. It indicates that digital advertising has a positive impact on consumer behavior. This finding

is similar to the findings of Saleem and Abideen (2011). Likewise, the beta coefficients for social media marketing are positive with consumer behavior. It indicates that social media marketing has a positive impact on consumer behavior. This finding is consistent with the findings of Putter (2017). Moreover, the beta coefficients for mobile marketing are positive with consumer behavior. It indicates that mobile marketing has positive impact on consumer behavior. This finding is similar to the findings of Kim et al. (2013). Furthermore, the beta coefficients for email marketing are positive with consumer behavior. It indicates that email marketing has a positive impact on consumer behavior. This finding is consistent with the findings of Omar and Atteya (2020). Similarly, the beta coefficients for product/service review are positive with consumer behavior. It indicates that product/service reviews have a positive impact on consumer behavior. This finding is similar to the findings of Omar and Atteya (2020).

## 4. Summary and conclusion

Digital marketing through mobile technologies, social media platforms, and eWOM has become a part of our global lives and serves as the new way for communication and marketing. Consumer behavior is important because it helps marketers understand what influences consumers' buying decisions. Recently, the field of marketing has become more developed due to the impact of high global competition on many sectors through new technology. These factors change customers' behavior.

This study attempts to determine the impact of digital marketing on consumer behavior in Kathmandu Valley. The study is based on primary data with 211 observations.

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.

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## Abstract

*This study examines the effect of store atmosphere on consumer purchase intention in retail stores of Kathmandu Valley. Consumer purchase intention is the dependent variable. The selected independent variables are window display, product display, lighting, music, cleanliness and parking. The primary source of data is used to assess the opinions of the respondents regarding the effect of store atmosphere in retail stores in Kathmandu Valley. The study is based on primary data with 150 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of store atmosphere on consumer purchase intention in retail stores of Kathmandu Valley.*

*The study showed that window display has a positive impact on consumer purchase intention. It implies that attractive window display in retail stores drives the purchase intention of the consumers. The result also revealed that product display has a positive impact on consumer purchase intention. It implies that better product display in the retail stores stimulates consumer purchase intention. In addition, parking has a positive impact on consumer purchase intention. It indicates that large parking space in the retail stores stimulates consumer purchase intention. Furthermore, lighting has a positive impact on consumer purchase intention indicating that sufficient and attracting lighting drives the consumer purchase intention. Similarly, the result also showed that music has a positive impact on consumer purchase intention. It indicates that pleasant music played in the retail stores stimulates consumer purchase intention. Moreover, cleanliness has a positive impact on consumer purchase intention. It indicates that clean stores drive the purchase intention of the consumers.*

**Keywords:** Consumer purchase intention, window display, product display, lighting, music, cleanliness and parking.

# 1. Introduction

In today's competitive environment, retailers make every effort to attract buyers and retain them in the store as long as possible. To achieve this goal, they develop various strategies and utilise all available and as unconventional as possible tools. The industry of retail is a kind of business where there are lots of up and down with high level of competition. The key factor for the success of retail store is its fast response and its ability in understanding consumer's behavior. The retail store must focus to its customer's preference and factors influencing a customer purchase decision (Singh et al., 2014). In today's continuously changing and dynamic business environment, it has become necessary for retail managers to clearly understand and foresee how different types of consumers behave when buying different products and services to fulfil their needs. Thus, to establish a competitive advantage in the marketplace, several retailers have focused on creating favourable images about their brands in the minds of consumers to influence their purchase behaviour (Shamsher, 2015). Store atmosphere is the key element in the purchasing attitude of consumers in their decision process. In other words, unique store atmospheric cues induce positive influences on the consumption context. It creates favourable customer perception towards the store and the products displayed in the store, eventually affecting the purchasing intention, and actual buying actions. According to Pan et al. (2008), store atmosphere is about designing the retail store environment in a way to affect customers' feelings and, in turn, to appeal to consumer buying behavior. This view includes physical products on display in the store, sales procedures, after sales services, and most importantly the aggregate atmosphere of this space. Store atmospherics induce impulse buying through positive affect and urge in the minds of consumers (Mohan et al., 2013). Retailers in unorganized markets and industries dealing with different categories should emphasize on different store attributes depending upon the type of customers they deal with (Koul and Mishra, 2013).

Impulse buying refers to unplanned, sudden buying behaviour, which is often accompanied by feeling of excitement and pleasure and/or a powerful urge to buy (Beatty and Ferrell, 1998). Ganesan et al. (2009) defined store atmosphere as the attributes that aims to intensify the store environment with the combination of different cues such as lighting, colour, music, and scent. Store atmosphere refers to the design of an environment to stimulate perceptual and emotional responses by consumers, and ultimately to influence their behavior (Yalch and Spangenberg, 1990). The atmospheric cues such as color, music, lighting, smell, crowding, windows display and storefront reflect the store atmosphere and play an important role in shoppers' perception and evaluation of the store at large. Stores with pleasant and moderately arousing atmospheres are likely to contribute to the overall favourableness of the store and effect buyer behavior in a positive way (Chebat et al., 2010). Jayaweera and Sirisena (2020) studied both exterior and interior factors which have an effect on customer purchasing intention. The study showed that exterior atmospheric, interior atmospheric, store layout and visual merchandising have a significant and positive impact on the re-purchase intention of the customers. Similarly, Sreedharan and Prakash (2019) assessed the impact of three store atmospheric factors namely ambient factors, design factors, and social factors on customer buying behaviors in shopping mall of Kannur. The study concluded that music and fragrance, colour and relaxation, display and temperature, cleanliness and neatness were important aspects considered by the customers while buying from stores in shopping mall.

According to Hussain and Ali (2015), atmospheric variables such as cleanliness, scent, lighting and display/layout have a positive influence on consumers purchase intention whereas music and color have insignificant impact on consumers purchase intention. Wakefield and Baker (1998) showed that the probability of customers visiting and staying longer in store increases due to atmospheric stimulus such as convenience,

choice of goods, huge space and low prices. The environment has a huge impact on the consumers' emotion and satisfaction and the impressive atmosphere of the retail chain outlets enhances the customer satisfaction level and purchase experience (Silva and Giraldo, 2010). Visual merchandising is the art and science of presenting products in the most visually appealing way, emphasizing on the communication with the customers through images and presentations. Davies et al. (2003) considered colours, lighting, forms and location, store layout, store equipment, goods and display as visual merchandising elements. Further, Pratiwi and Yasa (2019) store atmosphere has a positive and significant effect on purchasing decisions. Moayery et al. (2014) concluded that window display, in-store display/mannequin display and promotional signage directly affect impulse buying behavior. Mathur and Goswami (2014) stated that music can create a good atmosphere for shoppers but loud and poor-quality music can lead to a negative experience. Muniz et al. (2017) highlighted that playing the right kind of music (emotional and physical) can evoke desired behaviours in customers.

Mehta and Chugan (2013) outlined that visual merchandising includes both store exterior (window display, facade, retail premises) and interior (orienting factors, signage, layout, presentation techniques, props, spatial factors and ambient conditions). By using various combinations of visual merchandising elements, retailers aim at creating an attractive sales environment that affects emotions and behaviour of buyers at the store. High level of excitement and interest of the consumer reduces the ability to assess own actions rationally and enhances the probability of impulse buying. Widyastuti (2018) analyzed the factors that influence impulse buying using Structural Equation Models (SEM) with Partial Least Square (PLS) as statistical tools. The result revealed that visual merchandising which is measured by windows display, mannequin, floor merchandising and assortment has positive and significant effect on impulse buying. Attractive store atmosphere measured by lighting, layout, visual communication (color) and scent on the store has positive and significant effect on impulse buying. The amount of impulse buying can also be affected by creating private label product.

In the context of Nepal, Gnawali (2018) showed that the store layout in terms of floor space allocation, product grouping and department location have a positive impact on customer's buying intention. The study also concluded that there is a positive relationship of physical environment, temporal perspective and consumer purchase decision. Similarly, Shrestha (2018) argued that window display, in-store display and promotional signage have significant influence on impulse buying of customers. Window display creates appeal to the potential customers to enter into the store. Further, Palikhe (2019) revealed that there is significant relationship between in-store display and the impulsive buying behavior of consumers regarding apparel purchase. Store display plays an important role in the impulsive purchase decision of consumers regarding apparel purchase. Similarly, Pradhan (2016) examined the factors affecting impulsive buying behavior of consumers in supermarkets. This study concluded that store layout has a significant influence on impulsive buying behavior of consumers. Further, Aryal and Singh (2020) showed that there is a significant impact of music on consumer buying behaviour in retail store. Music can be used effectively in retail setting for long run to increase customer satisfaction, shopping duration as well as increasing sales

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the effect of store atmosphere on consumer purchase intention. 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 store atmosphere on consumer purchase intention in retail stores of Kathmandu Valley. Specifically, it examines the impact of window display, product

display, lighting, music, cleanliness and parking on consumer purchase intention in the retail stores of Kathmandu Valley.

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

## 2. Methodological aspects

The study is based on the primary data. The data were gathered from 142 respondents through questionnaire. The respondents' views were collected on window display, product display, lighting, music, cleanliness, parking and purchase intention. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that consumer purchase intention depends on window display, product display, lighting, music, cleanliness, and parking. Therefore, the model takes the following form:

Consumer purchase intention = f (window display, product display, lighting, music, cleanliness and parking)

$$CPI = \beta_0 + \beta_1 WD + \beta_2 PD + \beta_3 LT + \beta_4 MC + \beta_5 CL + \beta_6 PK + e$$

Where,

|     |   |                             |
|-----|---|-----------------------------|
| CPI | = | Consumer purchase intention |
| WD  | = | Window display              |
| PD  | = | Product display             |
| LT  | = | Lighting                    |
| MC  | = | Music                       |
| CL  | = | Cleanliness                 |
| PK  | = | Parking                     |

Window display 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 enter a store when I am attracted by an eye-catching window display", "I feel compelled to enter the store when I see an interesting window display" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.908$ ).

Product display 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 get an idea of what I want to buy after looking store mannequin or display", "Products displayed with a new style or design appeals me to purchase" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.840$ ).

Lighting 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 "Lighting in the store is fine", "The lighting in the outlets is pleasing to the eyes, and makes me to

stay more” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.866$ ).

Music 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 “Music in store motivates me to buy more”, “Pleasant environment created by music makes me spend more time in the store” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.870$ ).

Cleanliness 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 cleanliness of the outlet floor motivates me to buy more”, “The clean shelves of store outlets motivate me to stay more” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.897$ ).

Parking 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 store offers sufficient parking space”, “Store offers convenient parking areas” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.856$ ).

Consumer purchase 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 would like to purchase from the store”, “I would visit the store again” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.852$ ).

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

## Window display

Bashar and Irshad (2012) found that window display and impulsive purchasing are positively correlated. Likewise, Karbasivar (2011) analyzed the impact of window display, free product, cash discount and credit card on consumer impulse behavior. The study found that window display is regarded as the strongest variable which influences consumer impulse behavior among others. According to Nishanov and Ahunjonov (2016), there is a significant relationship between consumer impulse buying and window display. It means that if customers see an attractive and interesting window display, they are more likely to visit the store and purchase it. In addition, Bhatti and Latif (2014) proved that the consumer impulse buying behavior was significantly influenced by the window display. Patil et al. (2021) assessed the effect of store atmosphere on consumer buying behavior in Bengaluru retail stores. The findings of the study concluded that visual merchandising, such as window displays and mannequins are highly significant and has positive effect on purchase intention. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between window display and consumer purchase intention.

## Product display

Wanninayake and Randiwela (2007) investigated the impact of visual merchandising on consumer store choice decisions in Sri Lankan supermarkets. The study revealed that there is a significant positive influ-



ence of product display on consumer store choice decision. Similarly, Gudonavičienė and Alijosiene (2015) analysed the impact of visual merchandising on impulse buying behaviour. The study concluded that in-store design has the most significant and positive impact on impulse buying in Lithuania in clothing and footwear stores. Furthermore, Ghifari and Saefulloh (2018) examined store atmosphere's influence towards customer purchase intention. The findings of this study concluded that in-store, ambient cue, and out-store factor have a significant impact on customer purchase. In addition, Cornelius et al. (2009) found that the simple presence of a storefront product display is an effective way to positively augment a store's image with customers. Product display has a strong impact on the consumers purchase intention and customer's perception about the product. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between product display and consumer purchase intention.

## Lighting

Areni and Kim (1994) found that there is a positive relationship between lighting in the retail stores and consumer purchase intention. According to Boyce et al. (2000), a properly managed and well-lit room will always be recognized by the customers. Similarly, Ndengane et al. (2021) found that lighting has a positive impact on customer satisfaction. Likewise, Gillani (2012) showed that cool colour, temperature and lighting have a significant effect on attention and arousal states. This suggests that subjects' visual attention and emotional responses are greater when they are exposed to a cool colour, temperature and lighting. Furthermore, Aryal and Singh (2021) found that lightening, arrangements and temperature are the significant factors that influence the customers to spend more time on the store. Similarly, Custers et al. (2021) found a significant impact of lighting on perceived atmosphere in a retail environment. Lighting attributes and interior qualities were positively related to perceived atmosphere. In addition, Saeed (2015) found a positive effect of using light to divert consumer attention towards illuminated areas and products. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between lighting and consumer purchase intention.

## Music

Alpert and Alpert (1990) concluded that consumers spend more time and spend more money in the store if they find good music in the store. Similarly, Santos and Freire (2013) examined in flower shop where customers were exposed to a store environment with pop songs, romantic songs and with no music. The study revealed that customers spend more time in the romantic musical environment doing shopping in the store. Likewise, Holbrook and Anand (1990) showed that pleasant music is associated with longer consumption time. Music plays a significant role to make the customers spend more time in the store along with stimulating the purchasing behavior. In addition, Aryal and Singh (2020) examined an enhanced model for the impact of music on consumer buying behavior in retail store. The study concluded that music has a positive influence on consumer buying behavior in retail stores inside Kathmandu Valley. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between music and consumer purchase intention.

## Cleanliness

According to Gajanayake et al. (2011), cleanliness of a store creates positive impression among consumers and makes them stay longer in the store. The study concluded that cleanliness has significant positive impact on consumer purchase intention. Similarly, Wanninayake and Randiwela (2007) stated that product display and cleanliness are very important for the outlet selection and they directly influence the purchase intention of consumers. Likewise, Carpenter and Moore (2006) explained that there is a strong relationship between cleanliness and patronage intentions of willingness to revisit and willingness to stay longer in the store. Further, Abubakari et al. (2019) examined the impact of sanitation on customer retention in the restaurants of Tamale Metropolis. The finding of the study concluded that customer perception on sanitation has significant effect on retention. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between cleanliness and consumer purchase intention.

## Parking

Borgers and Timmermans (1986) found that store choice and pedestrian movements in shopping centres are strongly influenced by the location of entry points such as parking lots. Similarly, Brown (1991) showed that parking and consumer buying intention are positively correlated with each other. According to Mok (2021), there is a positive relation between parking and consumer buying behaviour. The results showed that transportation and location related factors, which consist of parking, catchment area and accessibility have positive influences on consumers' buying behaviours within the shopping malls. Further, Hanzaee and Javanbakht (2013) stated that the parking zone is a much more influential space on visitor's impression of the whole shopping complex which has a positive influence on the consumers buying intention. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between parking and consumer purchase intention.

## 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 150 observations. The dependent variable is CPI (Consumer purchase intention). The independent variables are WD (Window display), PD (Product display), LT (Lighting), MC (Music), CL (Cleanliness) and PK (Parking).

| Variables | Mean  | SD    | CPI     | WD      | ID | LG | MC | CL | PK |
|-----------|-------|-------|---------|---------|----|----|----|----|----|
| CPI       | 3.841 | 0.983 | 1       |         |    |    |    |    |    |
| WD        | 3.716 | 0.876 | 0.439** | 1       |    |    |    |    |    |
| PD        | 3.923 | 0.900 | 0.312** | 0.448** | 1  |    |    |    |    |

|           |       |       |         |         |         |         |         |         |   |
|-----------|-------|-------|---------|---------|---------|---------|---------|---------|---|
| <b>LT</b> | 3.358 | 1.013 | 0.209** | 0.246** | 0.317** | 1       |         |         |   |
| <b>MC</b> | 2.856 | 1.170 | 0.142*  | 0.249** | 0.225** | 0.469** | 1       |         |   |
| <b>CL</b> | 3.734 | 0.895 | 0.189*  | 0.259** | 0.249** | 0.285** | 0.328** | 1       |   |
| <b>PK</b> | 3.644 | 0.891 | 0.307** | 0.349** | 0.279** | 0.305** | 0.247** | 0.384** | 1 |

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

The study reveals that that window display is positively correlated to consumer purchase intention. It implies that attractive window display in retail stores drives the purchase intention of the consumers. The result also reveals that product display is positively correlated to consumer purchase intention. It implies that better product display in the retail stores stimulates consumer purchase intention. Furthermore, lighting is positively correlated to consumer purchase intention indicating that sufficient and attracting lighting drives the consumer purchase intention. Similarly, the result also shows that music is positively correlated to consumer purchase intention. It indicates that pleasant music played in the retail stores stimulates consumer purchase intention. Moreover, the result also shows that cleanliness is positively correlated to consumer purchase intention. It indicates that clean stores drive the purchase intention of the consumers. The result also shows that parking is positively correlated to consumer purchase intention. It indicates that large parking space in the retail stores stimulates consumer purchase intention.

## 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 window display, product display, lighting, music, cleanliness and parking on consumer purchase intention in retail stores of Kathmandu Valley.

**Table 2:** Estimated regression results of window display, product display, lighting, music, cleanliness and parking on consumer purchase intention in retail stores

The results are based on 150 observations using linear regression model. The model is  $CPI = \beta_0 + \beta_1 WD + \beta_2 PD + \beta_3 LT + \beta_4 MC + \beta_5 CL + \beta_6 PK + e$ , where the dependent variable is CPR (Consumer purchase intention). The independent variables are WD (Window display), PD (Product display), LT (Lighting), MC (Music), CL (Cleanliness) and PK (Parking),

| Model | Intercept           | Regression coefficients of |                    |                    |                    |                    |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------------|-------|---------|
|       |                     | WD                         | PD                 | LG                 | MC                 | CL                 | PK                 |                         |       |         |
| 1     | 0.745<br>(3.165)**  | 0.834<br>(13.511)**        |                    |                    |                    |                    |                    | 0.553                   | 0.658 | 50.846  |
| 2     | 1.359<br>(4.585)**  |                            | 0.634<br>(8.593)** |                    |                    |                    |                    | 0.331                   | 0.804 | 39.864  |
| 3     | 2.539<br>(9.852)**  |                            |                    | 0.389<br>(5.282)** |                    |                    |                    | 0.155                   | 0.904 | 32.991  |
| 4     | 3.177<br>(15.444)** |                            |                    |                    | 0.233<br>(3.490)** |                    |                    | 0.071                   | 0.948 | 30.593  |
| 5     | 1.792<br>(5.956)**  |                            |                    |                    |                    | 0.549<br>(7.006)** |                    | 0.246                   | 0.854 | 35.782  |
| 6     | 1.472<br>(5.349)**  |                            |                    |                    |                    |                    | 0.651<br>(8.870)** | 0.346                   | 0.796 | 43.314  |
| 7     | 0.652<br>(2.807)**  | 0.733<br>(6.649)**         | 0.082<br>(2.960)** |                    |                    |                    |                    | 0.552                   | 0.658 | 41.663  |
| 8     | 0.498<br>(1.879)*   | 0.749<br>(8.294)**         | 0.042<br>(0.464)   | 0.119<br>(2.016)*  |                    |                    |                    | 0.561                   | 0.651 | 71.059  |
| 9     | 1.108<br>(3.649)**  |                            |                    |                    | 0.027<br>(0.433)   | 0.227<br>(2.362)*  | 0.497<br>(5.378)** | 0.367                   | 0.782 | 64.391  |
| 10    | 0.501<br>(5.469)**  | 0.769<br>(5.469)**         | 0.035<br>(5.469)** | 0.169<br>(5.469)** | 0.077<br>(5.469)** |                    |                    | 0.564                   | 0.649 | 53.886  |
| 11    | 0.263<br>(0.956)    | 0.726<br>(7.953)**         | 0.004<br>(0.043)   | 0.153<br>(2.223)** | 0.110<br>(1.863)   | 0.187<br>(2.565)*  |                    | 0.580                   | 0.637 | 64.127  |
| 12    | 0.173<br>(0.633)    | 0.666<br>(7.155)**         | 0.009<br>(0.107)   | 0.118<br>(1.694)   | 0.009<br>(1.691)   | 0.107<br>(1.352)   | 0.197<br>(2.401)*  | 0.594                   | 0.627 | 59.687  |

**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 purchase intention is the dependent variable.

The regression results show that the beta coefficients for window display are positive with consumer purchase intention. It indicates that window display has a positive impact on consumer purchase intention. This finding is similar to the findings of Nishanov and Ahunjonov (2016). Likewise, the beta coefficients for product display are positive with consumer purchase intention. It indicates that product display has a positive impact on consumer purchase intention. This finding is consistent with the findings of Wanninayake and Randiwela (2007). Moreover, the beta coefficients for lighting are positive with consumer purchase intention. It indicates that lighting has a positive impact on consumer purchase intention. This finding is

similar to the findings of Ndengane et al. (2021). Furthermore, the beta coefficients for meaningful music are positive with consumer purchase intention. It indicates that music has a positive impact on consumer purchase intention. This finding is consistent with the findings of Holbrook and Anand (1990). In addition, the beta coefficients for cleanliness are positive with consumer purchase intention. It indicates that cleanliness has a positive impact on consumer purchase intention. This finding is similar to the findings of Abubakari et al. (2019). Likewise, the beta coefficients for parking are positive with consumer purchase intention. It indicates that cleanliness has a positive impact on consumer purchase intention. This finding is similar to the findings of Borgers and Timmermans (1986).

## 4. Summary and conclusion

Store atmosphere is the most important part of a marketing strategy for increasing sales and creating a positive store picture, as well as to influence customer buying behavior. The consumer's impulsive behaviour can be affected by what they see in a retail store. There is something that attracts the consumer to come closer at the store and even for buying products. Retail stores need to organize the look of the store as well and attractive for the consumer. Store arrangement through visual merchandising not only as magnificence, but also must has the allure to increase the interest of buyers to at least come to the store, and then buy the product.

This study attempts to examine the effect of store atmosphere on consumer purchase intention in retail stores of Kathmandu Valley. The study is based on primary data with 150 observations.

The study showed that window display, product display, lighting, music, cleanliness and parking have positive impact on consumer purchase intention in retail stores of Kathmandu Valley. The study concluded that better store atmosphere in the retail stores leads to increase purchase intention of consumer. The study also concluded that window display followed by parking and product display is the most influencing factor that explains the changes in consumer purchase intention in the retail stores of Kathmandu Valley.

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## Abstract

*This study examines the impact of e-banking on customer convenience in the context of Nepalese commercial banks. Consumer convenience is the dependent variable. The selected independent variables are security, ease of use, responsiveness, self-efficacy, reliability and feature availability. The primary source of data is used to assess the opinions of the respondents regarding the impact of e-banking on customer convenience. The study is based on primary data with 155 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 e-banking on customer convenience in the context of Nepalese commercial banks.*

*The result showed that ease of use has a positive impact on customer convenience. It implies that increase in ease of use of e-banking leads to increase in customer convenience. Moreover, responsiveness has a positive impact on customer convenience indicating that better responsiveness leads to increase in customer convenience. In addition, self-efficacy has a positive impact on customer convenience. It indicates that increase in the level of self-efficacy leads to increase in customer convenience. In addition, reliability has a positive impact on customer convenience indicating that increase in reliability on e-banking leads to increase in customer convenience. The study also showed that security has a positive impact on customer convenience. It reveals that better security leads to increase in customer convenience. Moreover, feature availability has a positive impact on customer convenience indicating availability of better features in e-banking leads to increase in customer convenience.*

**Key words:** Customer convenience, security, ease of use, responsiveness, self-efficacy, reliability and feature availability.

# 1. Introduction

The adoption of e-banking has been quite extensively considered as an innovative distribution channel of financial services due to rapid advances in e-banking applications and intensive competitive banking markets (Mortimer et al., 2015). The banking industry around the world has been drastically changing by the advent of digital technologies and internet. The intensive use of digital and networking technologies has enabled banks to deliver services electronically at a relatively low cost, high quality, and to interact with clients and stakeholders effectively. The increasing use of technology in banking sector allows banks to enhance customer satisfaction, boost retention and augment earnings (Alonso-Dos-Santos et al., 2020). The emergent popularity of IB has played a major role in the success and growth process of banking sector around the world (Xu et al., 2009). The advancements in banking sector not only boost the financial institutions of a country, but also strengthen the economy.

E-banking means the process through which a customer digitally interacts with a bank via computers without the need of a human contact (Jayawardhena, 2004). At the initial stage, e-banking was used to provide information about banking services. However, today's customers are using online banking both as a transactional as well as an informational medium, and experiencing the wide range of banking services it has to offer including account inquiry, bank statement download, cheque book order, bill payment, fund transfer, fixed deposit management, stock investment and insurance term payment (Tan and Teo, 2000). E-banking enables consumers to conveniently enjoy an array of customized banking services and assists banks in order to offer their services to a large number of consumers in a cost-efficient manner (Yoon and Steege, 2013). Due to the increasing rate of adoption of e-banking systems, banks face stiff competition in attracting and retaining customers with their e-banking platforms. In this context, providing high-quality e-banking service is considered a basic strategy for gaining competitive advantage in this service delivery platform (Makanyeza and Chikazhe, 2017). Essentially, enhancing the service quality of e-banking is viewed as the best strategic tool to make customers loyal to the e-banking system (Brun et al., 2014).

E-banking provides some unique services that are not available in offline banking, such as lack of interpersonal interaction, ubiquity and localization (Bauer et al., 2005). The ubiquity of e-banking services means access to banking services at any time and from anywhere (Al-Hawari, 2015). Localization means banks can track the location of the users and provide location-based banking services, such as information on the availability of ATMs (Yoon and Steege, 2013). In the e-banking context, customer loyalty could be defined as consumer tendency to frequently visit the bank's website, regularly avail e-banking services and spread a positive word of mouth about e-banking services (Amin, 2016). In particular, loyal e-banking customers tend to spread positive word of mouth through electronic devices and social media pages, thereby giving a positive impression of e-banking to other customers (Kaur et al., 2012). They will also prefer e-banking over other banking channels (Kandampully et al., 2015). Gera (2011) indicated that if consumers receive quality interactive services over an e-banking website, they will re-use this platform for availing banking services and recommend others to use it. Initial trust helps reduce customers' perceived risks. As such, initial trust is considered a crucial antecedent of customer loyalty to e-banking serving as a pillar in establishing a long-term relationship between customers and service providers (Hong and Cho, 2011). Trust enhances customers' long-term commitment to service providers, thereby enhancing customer loyalty to them (Kassim and Abdullah, 2010).

Timely transaction processing and an accurate billing system are the key success factors of e-banking which contribute to retaining customers with this platform (Liang and Pei-Ching, 2015). There are no face-to-face

interactions between the customers and service provider in the e-banking context, which creates some concerns with privacy and security issues while doing financial transactions using e-banking websites (Jin and Kim, 2010). If online banking service providers ensure safe transactions and keep privacy of personal information, consumers are more inclined to trust them. A transparent privacy and security policy helps generate favorable consumer responses to the service provider (Orel and Kara, 2014). E-service providers tend to design their website in a way that can provide in-depth information, reduce search efforts, and enhance interactivity with customers. Such website designs will in turn enhance customer trustworthiness in e-commerce platforms, and will encourage them to become loyal to the online service providers (Lee et al., 2006). Similarly, an advanced and interactive e-banking website interface enhances customer satisfaction and willingness to use online banking services more frequently (Li and Yeh, 2010). In the e-banking context, customers seek professional care and support if they encounter any hassles using e-banking services. Particularly, when e-banking providers update their technologies and websites, customers tend to seek technical support from e-banking providers (Thaichon et al., 2014). If an online customer care support team provides quick solutions to customer's queries, effectively demonstrating a hassle-free and transparent recovery policy, then customers tend to trust the service providers (Quach et al., 2016). In turn, these customers will remain loyal to them and spread positive word of mouth about their services.

In the banking industry, providing high-quality innovative outputs improve the satisfaction level of employees that eventually increases the productivity of these employees (Obeng and Mkhize, 2017). Efficient use of information technologies increases labour productivity levels (Sabherwal and Chan, 2001). Employees are directly related to banking activities and are crucial in the development, productivity enhancement, and success of banking institutions. Devising technology-driven strategies that facilitate knowledge discovery and enhance the skill sets of employees is vital because the success of banking institutions and the realization of their objectives depend largely on human resources. Improvements in the skills and competence of employees influence employee productivity that manifests in service offering responsiveness and customer satisfaction (Singh and Kaur, 2011). According to Curran and Meuter (2007), the expected outcomes such as efficiency and pleasure from using internet banking are the main reasons which affect the customer's intentions to accept internet banking. Shih and Fang (2004) also found a strong association between the customer's intentions and the usage of internet banking. Furthermore, Walker and Johnson (2006) reported that the customer's intentions to accept IB depend on the customer's views about their ability to operate such technology efficiently. The increased use of electronic banking services is considered to be one of the most important elements of success for banking systems (Alazzam et al., 2015). Technology helps to reduce costs and improve the relationships between the bank and its clients and motivate them to use various electronic services (Lee et al., 2005). As a result of technological developments in the banking sector, new banking services have been introduced, such as e-transfer, speaking bank, SMS services, e-trading for securities, electronic credit cards, ATMs and many other electronic services (Kaddomi, 2008).

In Nepalese context, Adhikari (2018) investigated the determinants of e-banking in Nepal. The study revealed that convenience, time savings, security and communication are the major factors that have positive effect on customer satisfaction on e-banking. Similarly, Joshi (2019) analyzed the impact of ATM service quality on the customer satisfaction, productivity, profitability in Nepalese banking sector. The study found that the ATM services have positive impact on the productivity and profitability. Shakya (2016) examined the relationship between online banking system on customer satisfaction and performance of Nepalese commercial banks. The study found that customers' satisfaction, ease of use, usefulness, security, responsiveness and efficiency are positively related to organization performance.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of e-banking on customer convenience. 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 e-banking on customer convenience in the context of Nepalese commercial banks. Specifically, it examines the impact of security, ease of use, responsiveness, self-efficacy, reliability and feature availability on customer convenience 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 primary data. The data were gathered from 155 respondents through a questionnaire. The respondents' views were collected on security, ease of use, responsiveness, self-efficacy, reliability and feature availability. The study is based on descriptive and causal-comparative research designs.

### The model

The model estimated in this study assumes that customer convenience depends on security, ease of use, responsiveness, self-efficacy, reliability and feature availability. Therefore, the model takes the following form:

$$CC = \alpha + \beta_1 SY + \beta_2 EOU + \beta_3 RS + \beta_4 SE + \beta_5 RL + \beta_6 FA + e$$

Where,

CC = Customer convenience

SY = Security

EOU = Ease of use

RS = Responsiveness

SE = Self-efficacy

RL = Reliability

FA = Feature availability

Security 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 "Information of customers are not misused by banks", "E-banking services provide strong commitment for security issues" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.88$ ).

Ease of use was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "I can do most of my banking transaction with e-banking", "It is easy to know how to use electronic banking" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.84$ ).

Responsiveness 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 is willing to help customers and provide prompt services”, “Bank informs their customers when a problem occurs and when services will be provided” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.85$ ).

Self-efficacy 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 don’t need special training to use e-banking services”, “I have the required knowledge, skill and ability to operate e-banking services” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.84$ ).

Reliability 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 “Bank has good and understandable employees”, “Bank completes a task accurately” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.88$ ).

Feature availability was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I am satisfied with the diversity of services”, “I can easily print account statement” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.76$ ).

Customer convenience was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I can access e-banking services anytime and anywhere”, “E-banking provides the comfort to transact from home with just a click” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.85$ ).

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

## Security

Security refers to the protection of information or systems from unauthorized intrusions. According to Hammoud et al. (2018), security and privacy have a significant impact on customer satisfaction. Shankar and Jebarajakirthy (2019) found that privacy and security enhance customer loyalty to e-banking. Khatoon et al. (2020) showed that security and privacy have a significant and positive impact on customer satisfaction. Likewise, Datta (2010) revealed that security, privacy, trust, innovativeness, familiarity and awareness level increase the acceptance of e-banking services among Indian customers. Similarly, Kumbhar (2011) reported that security and assurance are predictors of perceived value in e-banking. Poon (2008) concluded that convenience of usage, privacy and security are significant and positively related to the users’ adoption of e-banking services. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between security and customer convenience.



## Ease of use

Ease of use is one of the main factors for electronic banking customer acceptance (Daniel, 1999). The perceived ease of use has a positive relationship with the adoption of internet banking (Yiu et al., 2007). According to Jalal et al. (2011), perceived ease of use and perceived usefulness are not only antecedent to e-banking acceptance, they are also factors to retain customers to the use of e-banking system. Similarly, Hammoud et al. (2018) revealed that ease of use has a significant impact on enhancing customer satisfaction. According to Rawwash et al. (2020), perceived usefulness and ease of use directly and positively influence the e-banking usage. Furthermore, Ayo and Adewoye (2010) concluded that perceived usefulness, perceived ease of use, trust and organization reputation were the significant predictor of intention to continue to use e-banking services. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between ease of use and customer convenience.

## Responsiveness

Jun and Cai (2001) revealed that responsiveness has positive and significant effect on customer satisfaction. Similarly, Joseph et al. (1999) stated that there is a positive association of responsiveness with customer satisfaction. In addition, responsiveness and security have positive and significant association with customer satisfaction (Philipos, 2013). Similarly, Joshi (2015) found that there is positive relationship between responsiveness and customer satisfaction. Hammoud et al. (2018) found that responsiveness has a significant impact on customer satisfaction. Similarly, Khatoon et al. (2020) revealed that the customer using e-banking services were satisfied in terms of the e-banking products and responsiveness. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between responsiveness and customer convenience.

## Self-efficacy

Self-efficacy is the judgments of how well one can execute courses of action required to deal with prospective situations. Anouze and Alamro (2019) examined the factors affecting intention to use e-banking in Jordan. The study revealed that self-efficacy doesn't stand out as the barriers to intention to use e-banking services in Jordan. Oni et al. (2016) revealed that perceived e-service quality has a strong influence on customer satisfaction and use of e-banking, which means that greater quality of e-service has the potential to increase satisfaction and consequently result in to more use of e-banking. The study also showed that competence of e-service support staff, system availability, self-efficacy, service portfolio, responsiveness and reliability were found to be most significant in rating e-service quality. Furthermore, Sharif and Raza (2017) found positive influence of hedonic motivation, self-efficacy, trust and habit on adoption of internet banking. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between self-efficacy and customer convenience.

## Reliability

Addai et al. (2015) found a positive correlation between e-banking reliability and convenience and customer satisfaction. According to Hammoud et al. (2018), reliability, efficiency, ease of use, responsiveness, communication, security and privacy have a significant impact on enhancing customer satisfaction.

Shankar and Jebarajakirthy (2019) found that reliability enhanced customer loyalty to e-banking. Similarly, Haq and Awan (2020) concluded that reliability and website design proved to increase e-banking loyalty, particularly during COVID-19. Moreover, Khatoon et al. (2020) revealed that reliability has a significant positive impact on customer satisfaction. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between reliability and customer convenience.

## Feature availability

Ho and Lin (2010) showed that customers prefer website of the bank that enables them to complete online banking in a timely manner, correctly and respond promptly to their inquiries. The study also showed a positive relationship between necessary features in e-banking and customer satisfaction. Similarly, Bezhovski and Hussain (2016) concluded that early response to customer queries, fast processing to errors, availability of diverse features and solving their problems make customers feel satisfied and maintain long-term relationships. Moreover, Jayawardhena and Foley (2000) illustrated that web site features such as speed, web site content and design, navigation, interactivity and security have significant positive influence on user satisfaction. Poon (2008) found that features availability is critical to the success of the e-banking service. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between feature availability and customer convenience.

## 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 155 observations. The dependent variable is CC (Customer convenience). The independent variables are SY (Security), EOU (Ease of use), RS (Responsiveness), SE (Self-efficacy), RL (Reliability) and FA (Feature availability).

| Variables | Mean  | S.D.  | CC      | SY      | EOU     | RS      | SE      | RL      | FA |
|-----------|-------|-------|---------|---------|---------|---------|---------|---------|----|
| CC        | 4.312 | 0.596 | 1       |         |         |         |         |         |    |
| SY        | 3.967 | 0.658 | 0.285** | 1       |         |         |         |         |    |
| EOU       | 4.114 | 0.629 | 0.339** | 0.319** | 1       |         |         |         |    |
| RS        | 3.796 | 0.769 | 0.270** | 0.448** | 0.228** | 1       |         |         |    |
| SE        | 4.123 | 0.629 | 0.325** | 0.271** | 0.418** | 0.127*  | 1       |         |    |
| RL        | 3.803 | 0.775 | 0.317** | 0.369** | 0.290** | 0.404** | 0.250** | 1       |    |
| FA        | 4.030 | 0.570 | 0.334** | 0.317** | 0.080   | 0.232** | 0.230** | 0.300** | 1  |

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

The correlation matrix indicates that security is positively correlated to customer convenience. It reveals that better security leads to increase in customer convenience. Likewise, ease of use is positively correlated

to customer convenience. It implies that increase in ease of use of e-banking leads to increase in customer convenience. Moreover, responsiveness is positively correlated to customer convenience indicating that better responsiveness leads to increase in customer convenience. In addition, self-efficacy is positively correlated to customer convenience. It indicates that increase in the level of self-efficacy leads to increase in customer convenience. In addition, reliability is positively correlated to customer convenience indicating that increase in reliability on e-banking leads to increase in customer convenience. Moreover, feature availability is positively correlated to customer convenience indicating availability of better features in e-banking leads to increase in customer convenience.

## 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 security, ease of use, responsiveness, self-efficacy, reliability and feature availability on customer convenience in the context of Nepalese commercial banks.

**Table 2:** Estimated regression results of security, ease of use, responsiveness, self-efficacy, reliability and feature availability on customer convenience

The results are based on 155 observations using linear regression model. The model is  $CC = \alpha + \beta_1 SY + \beta_2 EOU + \beta_3 RS + \beta_4 SE + \beta_5 RL + \beta_6 FA + e$ , where the dependent variable is CC (Customer convenience). The independent variables are SY (Security), EOU (Ease of use), RS (Responsiveness), SE (Self efficacy), RL (Reliability) and FA (Feature availability).

| Model | Inter-cept          | Regression coefficients of |                    |                    |                    |                    |                    | Adj.R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------------|-------|---------|
|       |                     | SY                         | EOU                | RS                 | SE                 | RL                 | FA                 |                        |       |         |
| 1     | 2.620<br>(10.082)** | 0.427<br>(6.601)**         |                    |                    |                    |                    |                    | 0.217                  | 0.528 | 43.575  |
| 2     | 2.120<br>(8.039)**  |                            | 0.533<br>(8.413)** |                    |                    |                    |                    | 0.312                  | 0.495 | 70.774  |
| 3     | 3.150<br>(14.135)** |                            |                    | 0.306<br>(5.320)** |                    |                    |                    | 0.151                  | 0.549 | 28.304  |
| 4     | 2.270<br>(8.342)**  |                            |                    |                    | 0.495<br>(7.594)** |                    |                    | 0.269                  | 0.509 | 57.667  |
| 5     | 3.012<br>(13.939)** |                            |                    |                    |                    | 0.342<br>(6.140)** |                    | 0.192                  | 0.536 | 37.703  |
| 6     | 2.019<br>(6.996)**  |                            |                    |                    |                    |                    | 0.519<br>(8.027)** | 0.292                  | 0.502 | 64.429  |
| 7     | 1.699<br>(5.998)**  | 0.230<br>(3.410)**         | 0.413<br>(5.854)** |                    |                    |                    |                    | 0.356                  | 0.478 | 43.657  |
| 8     | 1.645<br>(5.764)**  | 0.173<br>(2.172)*          | 0.402<br>(5.666)** | 0.087<br>(1.352)   |                    |                    |                    | 0.36                   | 0.477 | 29.872  |
| 9     | 1.279<br>(4.318)**  | 0.107<br>(1.349)           | 0.280<br>(3.625)** | 0.109<br>(1.755)   | 0.252<br>(3.392)** |                    |                    | 0.402                  | 0.461 | 26.84   |
| 10    | 1.282<br>(4.328)**  | 0.079<br>(0.941)           | 0.270<br>(3.467)** | 0.092<br>(1.424)   | 0.242<br>(3.232)** | 0.068<br>(1.035)   |                    | 0.402                  | 0.461 | 21.696  |
| 11    | 0.728<br>(2.378)*   | 0.020<br>(0.239)           | 0.303<br>(4.100)** | 0.070<br>(1.144)   | 0.163<br>(2.235)*  | 0.025<br>(0.401)   | 0.343<br>(4.406)** | 0.468                  | 0.468 | 23.550  |

#### 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. Customer convenience is the dependent variable.

The regression results show that the beta coefficients for security are positive with customer convenience. It indicates that security has a positive impact on customer convenience. This finding is similar to the findings of Khatoon et al. (2020). Likewise, the beta coefficients for ease of use are positive with customer convenience. It indicates that ease of use has a positive impact on customer convenience. This finding is consistent with the findings of Walker and Johnson (2006). Further, the beta coefficients for responsiveness are positive with customer convenience. It indicates that responsiveness has a positive impact on customer convenience. This finding is similar to the findings of Jun and Cai (2001). Moreover, the beta coefficients for self-efficacy are positive with customer convenience. It indicates that self-efficacy has a positive impact on customer convenience. This finding is consistent with the findings of Anouze and Alamro (2019). In addition, the beta coefficients for reliability are positive with customer convenience. It indicates that reliability has a positive impact on customer convenience. This finding is similar to the findings of Addai et al. (2015). Further, the beta coefficients for feature availability are positive with customer convenience. It indicates that feature availability has a positive impact on customer convenience. This finding is consistent with the findings of Jayawardhena and Foley (2000).

## 4. Summary and conclusion

E-banking services play an essential role in the banking and financial world. However, despite this growth of the e-banking services in the world, most customers of the commercial banks continue to conduct banking transactions using traditional channels. Notwithstanding, many commercial banks in Nepal are eager to deliver e-banking services to their clients in an endeavor to enhance the speed and quality of their services and most importantly, to reduce transaction costs.

This study attempts to examine the impact of e-banking on customer convenience of Nepalese commercial banks. The study is based on primary data with 155 observations.

The study showed that security, ease of use, responsiveness, self-efficacy, reliability and feature availability have a positive impact on customer convenience in Nepalese commercial banks. The study concluded that better e-banking leads to customer satisfaction and convenience. The study also concluded that ease of use followed by feature availability are the most influencing factors that explain customer convenience in Nepalese commercial banks.

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## Abstract

*This study examines the impact of social media marketing on consumer buying behaviour of apparels in Kathmandu Valley. Consumer buying behaviour is the dependent variable. The selected independent variables are electronic word of mouth, blogs, social networking sites, micro blogging, social news site and media sharing system. The primary source of data is used to assess the opinions of the respondents regarding social media marketing and buying behaviour of apparels in Kathmandu Valley. The study is based on primary data of 174 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 behaviour of apparels in Kathmandu Valley.*

*The result showed that EWOM has a positive impact on consumer buying behavior. It reveals that better EWOM stimulates the consumer buying behavior toward apparels. In addition, the result also showed that media sharing system has a positive impact on consumer buying behavior. It indicates that reliable information shared by media positively influence the consumer purchase intention. Likewise, blog has a positive impact on consumer buying behavior. It implies that better blogs drive the consumer buying behavior. Similarly, social networking site has a positive impact on consumer buying behavior. It implies that better social network site stimulates the consumer buying behavior toward apparels. Moreover, microblog has a positive impact on consumer buying behavior. It indicates that better microblog drives the consumer buying behavior. Likewise, social news site has a positive impact on consumer buying behavior. It implies that better social news sites stimulate the consumer buying behavior.*

**Keywords:** Electronic word of mouth, blogs, social networking sites, micro blogging, social news site, and media sharing system.

# 1. Introduction

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. It will not necessarily affect consumer's decision-making, but might possess a mediating effect (Schivinski and Dabrowski, 2016). Social media can build brand attitudes that affect buying behavior. The good image of brand or product can lead the consumer to make decision on their purchases. When consumer's friend on social media shares or recommends services or products on their social media, it affects brand attitude and influences their decision-making. Consumer behavior is an important aspect of marketing as it assists marketers to devise strong and robust marketing strategies and techniques. Today, organizations are employing social media technique in order to change consumer's behavior and to win their loyalty. Similarly, social media helps organizations to communicate with their customers. Recommendations by friends or connections on social media also could help consumers on decision-making. Those recommendations could help brand attitudes, purchasing attitudes, and advertising attitudes. The better responses on the products or services, the more attractive for consumer purchasing (Prasath and Yoganathen, 2018).

Social media has revolutionized marketing practices like advertising and promotion (Hanna et al., 2011). It has also influenced consumer behavior from information search to post purchase behavior about a product (Mangold and Faulds, 2009). Ertemel and Ammoura (2016) examined the role of social media advertising on consumer buying behavior in fashion retail industry in Turkey. The findings showed a weak relation between social media advertising and consumer need recognition. In addition, social media provide three conditions that encourage consumer socialization among peers online. First of all, it provides communication tools that make the socialization process easy and convenient (Muratore, 2008). Second, an increasing number of consumers visit social media websites to find information which will help them to make various buying decisions (Lueg et al., 2006). In the end, social media offer vast product information and evaluations quickly acting as a socialization agent between friends and peers, because they facilitate education and information (Gershoff and Johar, 2006). Furthermore, social media platforms enable the two-way flow of information and allow companies to reach targeted groups, influencing the entire decision - making process (Smith et al., 2012).

Shojace and Azman (2013) confirmed that social media has a positive effect on brand awareness in terms of e-WOM, brand exposure and customer engagement. Moreover, Akbar and Ozgul (2018) found that social media enhances the social integration and emotional connection and integration into social routines of customers that ultimately increase brand awareness of consumers. Tatar and Erdogmus (2016) revealed the effect of marketing activities through social media on brand awareness, purchasing intentions and brand loyalty in hospitality business. Hartzel et al. (2011) mentioned that shared marketing approaches through social medias like Facebook and Twitter have significant positive effect on creating an image of a brand and generates a leveraging effect on brand-customer relationship. The widespread usage of social media has an effective role in discussing and knowing about a brand thereby promoting the brand among

its users (Kumar et. al., 2007). According to Qiutong and Rahman (2019), that relevant content has a positive relationship to cosmetic brand loyalty among college students. Likewise, Rayat et al. (2017) revealed that relevant content adds value to conversation and help to increase that loyalty of the consumer.

Through the use of social media tools, businesses are getting the opportunity to offer their products and brand promotion, promotion and advertising at low cost and also get feedback from there (Hanna et al., 2011). Erdogmus and Cicek (2012) stated that that brand loyalty of the customers is positively affected when the brand offers advantageous campaigns, offers relevant content, offers popular contents, appears on various platforms and offers applications on social media. In addition, providing mobile applications and popular contents allow customers to engage with the brand every day and create brand loyalty (Bredican and Vigar-Ellis, 2014). Customers who are exposed to plenty of brand messages on social media platforms filter out the content that is not relevant to them (Brito, 2011). Therefore, providing relevant and updated content is one of the most crucial strategies to manage a brand on social media successfully. Businesses can promote products and services, provide instant support, and/or create an online community of brand enthusiasts through all forms of social media such as social networking sites, content communities, virtual worlds, blogs, microblogging sites, online gaming sites, social bookmarking, news sites, forums and more (Kaplan and Haenlein, 2009). Additionally, social media enables consumers to share information with their peers about the product and service brands (Mangold and Foulds, 2009).

Social media marketing is a latest practice of business engaged in marketing goods, services, ideas and information through the online transaction (Balakrishnan et al., 2014). Social media marketing creates brand equity and brand image among the consumers. The study also found that brand awareness and brand image play significant role that mediates the relationship between social media marketing and purchase intention (Hilal, 2018). Moreover, due to rapidly advancing technologies and fast changing market dynamics, digital marketing has grown phenomenally (Mort and Drennan, 2005). Digital marketing allows the companies to reach their target audience in a more cost efficient and measurable way thus measuring return on investment on advertising (Pepelnjak, 2009). Hence, digital marketing offers the customers a lot of benefits ranging from staying updated with latest information, comparative analysis with competitors, instant purchase, greater customer engagement and sharing reviews about the experience. According to Voramontri and Klieb (2019), social media sites can influence consumer behavior in all the decision-making stages. Social media influencers often used products according to their lifestyle and shared the reviews in their social media accounts. According to Munukka et al. (2016), an influencer could evaluate a product that consumers would admire, encouraging them to purchase it. Furthermore, social media provide the latest information and were able to influence consumers' attitudes and behaviors (Liu et al., 2015).

In the context of Nepal, 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). Sharma and Lijuan (2015) investigated service quality of e-commerce websites in online platform and their contribution on e-business promotion. The study found that information quality is confirmed to be an important factor in promoting customer commitment. Rana (2016) found that consumers are less concern about the brand image while making a purchase decision. The study also revealed that people are more influenced by word of mouth and opinion given by the people they know on Facebook and it substantially affects their buying behavior.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of social media marketing on consumer purchase intention. Though there are above mentioned

empirical evidences in the context of other countries and in Nepal, no such evidence using more recent data exists in 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 social media marketing on consumer purchase intention of apparels in Kathmandu Valley. Specifically, it examines the impact of electronic word of mouth, blogs, social networking sites, micro blogging, social news site, and media sharing system on consumer buying behaviour of apparels 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 primary sources of data. The data were gathered from 174 respondents through questionnaire. The respondents' views were collected on electronic word of mouth, blogs, social networking sites, micro blogging, social news site, media sharing system and buying behaviour. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that consumer buying behaviour depends on electronic word of mouth, blogs, social networking sites, micro blogging, social news site, and media sharing system. Therefore, the model takes the following form:

$$\text{CBB} = \alpha + \beta_1 \text{EWOM} + \beta_2 \text{BLOG} + \beta_3 \text{SNS} + \beta_4 \text{MB} + \beta_5 \text{SONS} + \beta_6 \text{MSS} + e$$

Where,

CBB = Consumer buying behavior

EWOM = Electronic word of mouth

BLOG = Blogs

SNS = Social network sites

MB = Micro blogging

SONS = Social news sites

MSS = Media sharing system

Electronic word of mouth (EWOM) 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 usually check the reviews in social media", "I believe in comments of different users in social networking" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.886$ ).

Blogs 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 usually visit blogs", "I trust information provided in blogs", and so on the reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.842$ ).

Social network site 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 a regular user of social networking sites”, “I visit social networking sites with specific purpose in mind” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.807$ ).

Micro blogging 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 usually visit micro blogs”, “I trust information provided in micro blogs” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.872$ ).

Social news site 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 user of social news sites”, “I visit social news sites with specific purpose in mind” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.849$ ).

Media sharing system was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I go through media sharing sites while making purchase decisions”, “Media sharing sites on the internet helps to purchase correct product” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.851$ ).

Consumer buying 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 “Social media advertisements help in making purchase decisions”, “Social media marketing influence my purchase decision” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.867$ ).

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

## Electronic word of mouth

E-WOM is defined as any positive or negative statement made by potential, actual, or former customers about a product or company, which is made available to different people and institutions through the internet. Lopez and Sicilia (2014) found that there exists a positive relationship between consumers’ internet experience and e-WOM. Yusuf and Busalim (2018) found that eWOM engagement has a significant positive influence on consumer purchase intention. Moreover, Hamdani and Maulani (2018) concluded that E-WOM has positive influence on purchase intention. Consumers are wary of marketing communications from companies and prefer reviews and opinions from friends or other consumers. In the new hyperconnected world, they are online reviews (i.e., electronic word-of-mouth). By actively interacting with the influencers, eWOM can be positively impacted, which in turn, may enhance the engagement of prospective customers with the brand (Srivastava et al., 2021). Based on it, the study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between electronic word of mouth and consumer buying behaviour.

## Blogs

Blogs are considered as one of the well-known social media platforms and a powerful marketing tool. Blogs have unremittingly garnered a reliable audience. Some bloggers do have the power to cause an item to sell out by simply tweeting a link to where followers can buy it (Keng and Ting 2009). According to Ali and Anwar (2021), blog has significant positive influence on consumer behavior. Hsu et al. (2013) found that the effectiveness of celebrity endorsement on microblogging platforms is largely affected by celebrity-followers' online involvement. Microblog has a positive relation with the online customers. Moreover, Gul et al. (2014) showed that the blog has a huge capacity to influence consumers towards their product/services buying decisions. According to Abdulraheem and Imouokhome (2021), attitude towards blogger recommendations have positive and significant influence on consumer purchase intention. In addition, Gaudeul and Peroni (2010) showed that the bloggers do not only produce content to post on their blogs, but also often build social relations with their readers and other bloggers, which have positive relation with the customers buying behaviors. Based on it, the study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between blogs and consumer buying behaviour.

## Social networking sites

It is one of the most effective and significant business development tools in the 21st century because of its ability to connect individuals with others. Internet has proven to be a lucrative communication channel linking the customers and the organizations (Alsubagh, 2015). According to De Maeyer (2012), consumers are much more likely to post reviews when they are highly satisfied with the offerings of the product, which results in the bimodal distribution of online ratings. Similarly, Putta and Evanita (2018) found that there is significant and positive between social media and purchase intention. Moreover, Al-Abdallah et al. (2021) concluded that social networking sites have a significant positive direct impact on the purchasing decision process of luxury vehicles. According to Nofal et al. (2020), social networking sites advertisement has a significant impact on brand awareness and consumer purchase decisions. Furthermore, Farzin and Fattahi (2018) revealed that social networks were viewed as an effective tool in corporate advertising strategies and have a significantly positive relation with the consumer behavior. Based on it, the study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between social networking sites and consumer buying behaviour.

## Microblogging

Microblogging behaviors include the writing of comments below a celebrity micro blogger's message, retweeting a celebrity's message on their own microblog, sending messages directly to a celebrity micro blogger, and instantly following or unfollowing a celebrity micro blogger at any time (Kim et al., 2014). Zhou et al. (2017) found that the online retailers micro-blog posts, which are characterized by informativeness and persuasiveness as perceived by customers, positively impact online retailers' brand equity, which in turn influences consumer purchase intention. Similarly, Hsu et al. (2010) concluded that micro blogging positively affects the buying behavior of the consumers. Back-and-forth-type discussion and retweets are effective in generating awareness and positive attractiveness and generate a positive sentiment towards the consumers (Akcura et al., 2018). According to Hennig-Thurau et al. (2015), microblogging word of mouth shared through Twitter and similar services affects early product adoption behaviors by immediately dis-

seminating consumer's post- purchase quality evaluations. Likewise, Ding and Qui (2017) stated that the effectiveness of celebrity endorsement on microblogging platforms is largely affected by celebrity-followers' online involvement. The study also showed that microblog has positive relationship with the online customers' purchase behavior. Based on it, the study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between microblogging and consumer buying behaviour.

## **Social news site**

Ather et al. (2018) examined the relationship between social media marketing and consumer buying behavior in Peshawar. The study found a positive relationship between social sites, social news site and electronic word of mouth have positive impact on consumer buying behavior in Peshawar. Moreover, Ko et al. (2010) found that social media marketing and news site positively influences customer relationships and purchase intention. Likewise, Nasir et al. (2012) found that social media marketing and website credibility have positive impact on consumer purchase intention. Ansari et al. (2019) revealed that social media marketing and social news site influences the customer purchase intention positively. Based on it, the study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between social news site and consumer buying behaviour.

## **Media sharing system**

A website that enables users to store and share their multimedia files (photos, videos, music) with others is known as media sharing. Such sites provide a modest amount of free storage and paid subscriptions for greater storage. Dehghani and Tumer (2015) showed that Facebook advertising significantly affects brand image and brand equity, which contribute to a significant change in purchasing intention. Keib et al. (2018) showed that posts containing positive images elicited a higher level of visual attention than those with negative or no images, which led to higher intentions to click and share posts with positive images. Furthermore, Zhao et al. (2020) found that there is a positive correlation among features of social media, ambient awareness, knowledge sharing and purchase intention. Palalic et al. (2020) showed that there is positive association between social media, media sharing system and buying behavior. Based on it, the study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship between media sharing system and consumer buying behaviour.

# **3. Results and discussion**

## **Correlation analysis**

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



**Table 1:** Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 174 observations. The dependent variable is CBB (Consumer buying behavior). The independent variables are EWOM (Electronic word of mouth), BLOG (Blogs), SNS (Social network sites), MB (Micro blogging), SONS (Social news sites), and MSS (Media sharing system).

| Variables   | Mean  | S. D. | CBB     | EWOM    | BLOG    | SNS     | MB      | SONS    | MSS |
|-------------|-------|-------|---------|---------|---------|---------|---------|---------|-----|
| <b>CBB</b>  | 3.794 | 0.978 | 1       |         |         |         |         |         |     |
| <b>EWOM</b> | 3.671 | 1.049 | 0.513** | 1       |         |         |         |         |     |
| <b>BLOG</b> | 3.485 | 0.989 | 0.495** | 0.535** | 1       |         |         |         |     |
| <b>SNS</b>  | 3.714 | 0.919 | 0.416** | 0.474** | 0.529** | 1       |         |         |     |
| <b>MB</b>   | 3.503 | 1.027 | 0.536** | 0.529** | 0.650** | 0.517** | 1       |         |     |
| <b>SONS</b> | 3.585 | 0.989 | 0.540** | 0.536** | 0.511** | 0.547** | 0.499** | 1       |     |
| <b>MSS</b>  | 3.575 | 1.010 | 0.585** | 0.544** | 0.493** | 0.518** | 0.535** | 0.627** | 1   |

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

Table 1 shows that EWOM is positively correlated to consumer buying behavior. It reveals that better EWOM stimulates the consumer buying behavior toward apparels. Likewise, blog is positively correlated to consumer buying behavior. It implies that better blogs drive the consumer buying behavior. Similarly, social networking site is positively correlated to consumer buying behavior. It implies that better social network site stimulates the consumer buying behavior toward apparels. Moreover, microblog is positively correlated to consumer buying behavior. It indicates that better microblog drives the consumer buying behavior. Likewise, social news site is positively correlated to consumer buying behavior. It implies that better social news sites stimulate the consumer buying behavior. In addition, the result also shows that media sharing system is positively correlated to consumer buying behavior. It indicates that reliable information shared by media positively influence the consumer purchase intention.

## 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 EWOM, blogs, social networking sites, micro blogging, social news site, and media sharing system on consumer buying behaviour of apparels in Kathmandu Valley.

**Table 2:** Estimated regression results of EWOM, blogs, social networking sites, micro blogging, social news site, and media sharing system on consumer buying behavior

The results are based on 211 observations using linear regression model. The model is  $CBB = \alpha + \beta_1 EWOM + \beta_2 BLOG + \beta_3 SNS + \beta_4 MB + \beta_5 SONS + \beta_6 MSS + \epsilon$ , where the dependent variable is CBB (Consumer buying behavior). The independent variables are EWOM (Electronic word of mouth), BLOG (Blogs), SNS (Social network sites), MB (Micro blogging), SONS (Social news sites), and MSS (Media sharing system).

| Model | Intercept          | Regression coefficients of |                     |                    |                     |                     |                     | Adj. $R_{bar}^2$ | SEE   | F-value |
|-------|--------------------|----------------------------|---------------------|--------------------|---------------------|---------------------|---------------------|------------------|-------|---------|
|       |                    | EWOM                       | BLOG                | SNS                | MB                  | SONS                | MSS                 |                  |       |         |
| 1     | 1.574<br>(7.619)** | 0.605<br>(11.180)**        |                     |                    |                     |                     |                     | 0.417            | 0.746 | 124.983 |
| 2     | 1.590<br>(7.583)** |                            | 0.632<br>(10.925)** |                    |                     |                     |                     | 0.406            | 0.754 | 119.345 |
| 3     | 1.598<br>(6.195)** |                            |                     | 0.591<br>(8.767)** |                     |                     |                     | 0.305            | 0.815 | 76.867  |
| 4     | 1.525<br>(7.845)** |                            |                     |                    | 0.648<br>(12.168)** |                     |                     | 0.459            | 0.719 | 148.071 |
| 5     | 1.329<br>(6.604)** |                            |                     |                    |                     | 0.688<br>(12.708)** |                     | 0.481            | 0.704 | 161.486 |
| 6     | 1.196<br>(6.610)** |                            |                     |                    |                     |                     | 0.727<br>(14.922)** | 0.562            | 0.647 | 222.669 |
| 7     | 1.126<br>(5.351)** | 0.374<br>(5.593)**         | 0.371<br>(5.238)**  |                    |                     |                     |                     | 0.495            | 0.695 | 85.818  |
| 8     | 0.987<br>(4.263)** | 0.346<br>(4.974)**         | 0.316<br>(3.924)**  | 0.117<br>(1.418)   |                     |                     |                     | 0.534            | 0.668 | 50.474  |
| 9     | 0.858<br>(4.044)** | 0.195<br>(2.863)**         | 0.086<br>(0.964)    | 0.095<br>(1.141)   | 0.277<br>(3.264)**  | 0.363<br>(4.606)**  |                     | 0.583            | 0.631 | 49.450  |
| 10    | 0.827<br>(4.114)** | 0.127<br>(1.920)*          | 0.093<br>(1.098)    | 0.143<br>(1.804)*  | 0.204<br>(2.494)*   | 0.172<br>(2.014)*   | 0.385<br>(4.529)**  | 0.627            | 0.597 | 49.412  |

**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.

The regression results show that the beta coefficients for EWOM are positive with consumer buying behavior. It indicates that EWOM has a positive impact on consumer buying behavior. This finding is consistent with the findings of Hamdani and Maulani (2018). Similarly, the regression result shows that the beta coefficients for blogs are positive with consumer buying behavior. It indicates that blogs have a positive impact on consumer buying behavior. This finding is similar to the findings of Abdurraheem and Imouokhome (2021). Likewise, the beta coefficients for social networking sites are positive with consumer buying behavior. It indicates that social networking sites has a positive impact on consumer buying behavior. This finding is consistent with the findings of Putta and Evanita (2018). Moreover, the beta coefficients for microblogging are positive with consumer buying behavior. It indicates that microblogging has a positive impact on consumer buying behavior. This finding is consistent with the findings of Hennig-Thurau et al. (2015). Further, the beta coefficients for social news site are positive with consumer buying behavior. It

indicates that social news site has a positive impact on consumer buying behavior. This finding is consistent with the findings of Ansari et al. (2019). In addition, the beta coefficients for media sharing system are positive with consumer buying behavior. It indicates that media sharing system has a positive impact on consumer buying behavior. This finding is similar to the findings of Keib et al. (2018).

## 4. Summary and conclusion

Social media marketing activities have been recognized as one of the most influential sources of marketing for reaching a greater audience and growing business. The emergence of social media sites has changed the way marketers interact with customers. This phenomenon impacts consumers as it affects their purchase intentions. Social media has become an important communication channel for marketers as it influences consumers when they are purchasing products and services.

This study attempts to examine the impact of social media marketing on consumer buying behaviour of apparels in Kathmandu Valley. The study is based on primary data gathered from 174 respondents.

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.

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## Abstract

*This study examines the impact of brand image and corporate branding on consumer choice of smart phones in Kathmandu. Consumer choice is the dependent variable. The selected independent variables are brand image, brand preference, brand loyalty, brand value and brand trust. The primary source of data is used to assess the opinions of the respondents regarding brand image and corporate branding of smart phones in Kathmandu Valley. The study is based on primary data gathered from 150 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The regression models are estimated to test the significance and effect of brand image and corporate branding on consumer's choice of smart phones in Kathmandu Valley.*

*The study showed that brand trust has a positive impact on consumer's choice of smart phones. It indicates that increase in brand trust stimulates the consumer behavior to choose the specific brand phone. Similarly, brand image has a positive impact on consumer's choice. It indicates that better brand image stimulates the consumer behavior to choose the specific brand phone. Likewise, brand preference has a positive impact on consumer's choice. It indicates that higher brand preferences drive the consumer behavior to choose the specific brand phone. Similarly, brand loyalty has a positive impact on consumer's choice indicating that higher brand loyalty stimulates the consumer behavior to choose the specific brand phone. Furthermore, brand value has a positive impact on consumer's choice indicating that higher brand value drives the consumer behavior to choose the specific brand phone.*

**Keywords:** Consumer's choice, brand preference, brand loyalty, brand value, brand image and brand trust.

# 1. Introduction

Branding has emerged as part of modern-day marketing strategies and now considered a key organizational asset (Proctor, 2014). In order to survive in the market, companies are keenly interested in developing strong brands that leads to long term and customer relationships. Though many companies are able to have better products and yet are sometimes unable to compete in the market due to poor branding activities. Thus, strong brands have the potential to generate long term and loyal customers, which would eventually lead to an increase in sales in the future (Hess et al., 2011). There are a lot of ways to make customer satisfied and become loyal. One way is by building positive brand image (Randal, 2001). Creating strong and positive brand can make customers feel and think that the product or service offered is better than its competitors. Brand image is a set of brand associations formed and attached to the minds of customers. Customers who are accustomed to using certain brands tend to have the consistency of brand image.

Advertising has the most visible and significant influence on consumer purchasing behavior. Customers who are loyal to a brand are more likely to buy and stick with the same variant of product or service, and they are also more likely to be brand ambassadors to others (Back & Parks, 2003). Commitment and customer satisfaction are important determinants of customer

loyalty. It is much easier to persuade existing customers than it is to persuade new customers. Loyalty is a deeply held commitment to consistently repurchase or repertory a preferred product or service in the future. Brand loyalty is a critical strategic component in achieving long-term competitive advantage. This is due to the fact that firms must invest less in marketing and expend less effort in addressing loyal customers as opposed to disloyal customers (Spiros & Vlasis, 2004). Brand image and brand loyalty are the most essential characteristics that influence consumer perceptions and brand equity in the marketplace (Alhaddad, 2014). According to Mokhtar et al. (2000), brand loyalty, is critical to an organization's profitability and future growth. Over time, loyal customers stick with their suppliers or service providers. One of the most important aspects of business strategy is branding. Branding is essential for creating and maintaining customer value, as well as for gaining and maintaining competitive advantage. Branding is the process of establishing a relationship or connection between a company's product and the customer's emotional perception in order to generate sales (Hislop, 2001).

Brand is the most valuable asset for any company and has been widely recognized as an essential reason for consumer choice. It serves as a tool for consumers to check the differentiation of the products and their uniqueness whereby it enriches consumers trust and confidence in facilitating their decision-making process. It alleviates some of the problems associated with their experience and credence qualities (Kremer and Viot, 2012). According to Bloemer and Ruyter (1998), brand name and image have a direct positive impact on consumer purchasing decisions and loyalty. Customers who are loyal are willing to pay a higher price even if the price has increased because the perceived risk is high, and they would rather pay a higher price to avoid the risk of any change (Yoon and Kim, 2000). Brand loyal customers are willing to pay a higher price for their preferred brand. Asshidin et al. (2016) discovered that perceived quality has a significant impact on consumer purchase intention. Furthermore, Ergin et al. (2005) discovered that brand loyalty has a positive and significant impact on the purchasing decision of cosmetics products among Turkish women. Similarly, Chi et al. (2009) discovered that brand awareness has a positive impact on consumers' purchasing intentions. Singh (2012) concluded that consumers with positive brand awareness are more likely to purchase well-known brand products as a way to reduce purchase risks.

Sondoh et al. (2007) assessed the effect of brand image on overall satisfaction and loyalty intention in the context of color cosmetic in Malaysia. The study found that positive brand image influence customer loyalty so that they would repurchase more product or service and recommend others to buy. Similarly, Davies et al. (2003) stated that the strong brand image will make customer satisfied. Brand image has something to do with product appearance so when customers are satisfied with it, they will become loyal to the brand even though they have other optional brands. According to Grewal & Levy (2010), brand associations reflect the mental links that customers make between a brand and its key product attributes, such as a logo, slogan or famous personality. These brand associations often result from a firm's advertising and promotional efforts. It has become imperative for competitive firms to gain customer loyalty that will elaborate the relationship management between customers and the firm (Filip and Anghel, 2009). The consumers that show the greatest levels of loyalty toward the product or service activity, tend to repurchase more often, and spend more money. Thus, loyal customers do not only increase the value of the business, but also enable business to maintain costs lower than those associated with attracting new customers (Barroso and Martin, 1999). In addition, brand loyalty also contributes in reducing the costs of doing business, thus improving brand as well as company's profitability. Recruiting new customers is up to six times expensive while compared to retaining the existing customers (Rosenberg and Czepiel, 1993). A firm that has loyal customers does not have to allocate a big budget for promotional activities. Al-Areqi et al. (2018) assessed determinants of customer loyalty in Yemen banking industry. The study showed a significant and positive correlation of customer loyalty with various factors including service quality, bank image, customer satisfaction and trust. Similarly, Lin and Wang (2006) found that customer loyalty is affected by perceived value, trust, habit, and customer satisfaction. The study also showed that customer satisfaction plays a crucial intervening role in the relationship of perceived value and trust to loyalty. Chunnoo and Chen (2019) assessed customer loyalty and its determinants on foreign banks in Malaysia. The study indicated that service quality, corporate image and switching costs are the main factors most likely to influence customer loyalty of foreign banking customers. The study further proved that trust did not radiate any effect on customer loyalty.

Ashraf et al. (2017) examined the relationship between consumer buying behavior and advertisement, brand image, brand association and brand loyalty in footwear industry. The study found a positive relationship of advertisement, brand image, brand association and brand loyalty with consumer buying behavior. Brand loyalty is very important for the success of every type of brand. Consumers can be loyal to a specific brand according to the dimensions of consumer behavior. Loyal consumers help in gaining a high market share. To make new customer loyal, it needs to invest five times more cost than to retain the current and existing consumers. Loyal consumers can provide the competitive edge against competitors which is a significance factor for success (McGoldrick and Andre, 1997). With the growing pace of globalization, competition is increasing and to compete with other brands, innovation is needed. Brands create the sense of status consciousness in many consumers which leads to the sense of recognition and using different brand products is the new trend of fashion. People feel pleasure when they are recognized in society, friends and family in connection of specific brand which is mostly used by a person. Consumers should have the brand awareness. It basically includes awareness of brand and the information or image of brand in the mind of consumers. Awareness of brands help consumers to recall the brands easily and it creates a positive image about the brand in consumers' mind. Awareness of brand leads to the creation of brand image in consumer's mind which helps in future purchases of the same product (Lim and O'Cass, 2001). Brand image is basically the association and attachment of consumer with the brand.

In the context of Nepal, Kayastha (2018) discovered that brand image and brand credibility have a positive relationship with brand loyalty. Brand loyalty is also correlated to brand trust, customer satisfaction, and service quality. Similarly, Shrestha (2018) found that product quality and brand image is important factors in determining brand loyalty. Moreover, Gautam and Shrestha (2018) found that brand loyalty and brand awareness are the significant factors that influence the purchase intention of smartphones. Furthermore, Sharma (2019) investigated the role of customer satisfaction on brand image in the context of Nepalese commercial banks located at Butwal Sub- Metropolitan city. The study showed a strong relationship between brand image and customer satisfaction. The study also indicated that brand image of the commercial banks is highly concerned with the satisfaction level towards their customers.

The above discussion shows that empirical evidences vary greatly across the studies concerning on the impact of brand image and corporate branding on consumer's choice. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such evidence using more recent data exists in Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study is to examine is the impact of brand image and corporate branding on customer's choice of smart phones in Kathmandu Valley. Specifically, it analyzes the relationship of brand preferences, brand value, brand loyalty, brand image and brand trust with consumer's choice of smart phones 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 sections draws the conclusion.

## 2. Methodological aspects

The study is based on primary sources of data. The data were gathered from 150 respondents through questionnaire. The respondents' views were collected on brand preferences, brand value, brand loyalty, brand image and brand trust of smart phones. The study is based on descriptive as well as causal comparative research designs.

### The model

The model estimated in this study assumes that consumer's choice depends on different variables such as brand preferences, brand value, brand loyalty, brand image and brand trust. Therefore, the model takes the following form:

$$CC = \beta_0 + \beta_1 BI + \beta_2 BP + \beta_3 BL + \beta_4 BV + \beta_5 BT + e$$

Where,

CC = Consumer's choice

BI = Brand image

BP = Brand preference

BL = Brand loyalty

BV = Brand value

BT = Brand trust

Brand 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 brand that I am using can easily be recalled by the logo of a specific product,” “I know what the specific product looks like of the brand I am using” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.712$ ).

Brand preference 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 like this brand more than any other brands of mobile phone,” “Brand is very important to define my choice of mobile phone” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.789$ ).

Brand 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 would not buy other brands if that specific product is available at the store,” “That specific product would be my first choice” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.715$ ).

Brand value was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I would rank this brand as my first choice for purchasing,” “The image of the brand which I am using represent what I want” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.846$ ).

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 “The brand which I am using would be honest and sincere in addressing my concerns,” “The brand which I am using would make any effort to satisfy me” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.797$ ).

Consumer’s choice 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 this brand is made of high-quality materials,” “I would recommend this brand to others” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.763$ ).

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

## Brand preference

Brand preference is the degree to which a consumer prefers to use a particular brand’s product over the competitors. Jeyalakshmi et al. (2020) examined the influence of brand awareness on customers buying behavior. The study showed a positive effect of brand awareness, brand loyalty and brand preference on the customers buying behavior. Likewise, Goode et al. (2010) found that there is a significant positive relationship between brand preferences and consumer’s choice. Moreover, Keller (2003) showed that brand preferences positively affect the consumer’s choice. Based on it, the study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between brand preference and consumer’s choice.

## Brand value

Brand value is defined as a customer's assessment of a brand based on their perception of the brand when considering what the brand provides. Kamakura and Russell (1993) found that brand value is the most important factor that influences consumer choice positively. Likewise, Baek et al. (2010) examined the differential roles of brand credibility and brand prestige in consumer brand choice. The study showed that brand value has a positive and significant relationship with consumer brand choice. According to Zeithaml et al. (1996), customers would remain loyal as long as the perceived value of products/services is relatively greater than that of competitors' offerings. Based on it, the study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between brand value and consumer's choice.

## Brand loyalty

Brand loyalty represents a repurchase commitment in the future purchase. The concept of brand loyalty is very crucial due to its importance in business performance and benefits for an organization (Awan and Rehman, 2014). Erdumlu et al. (2017) analyzed the consumer behaviour and the influence of brand loyalty in purchasing sportswear products. The study revealed that brand loyalty influences purchase decisions positively. Severi and Ling (2013) stated that a strong brand offers the customers with several access point towards the brand and attract them through, both, emotional and functional attitudes. The brand loyal customers are likely to buy and stick to the same variant of product or service and are also likely to be the brand ambassador to others (Back, 2003). Brand loyalty is a sort of commitment towards the brand that induces a re-buy behavior into the customer in spite of the potential marketing attempts by competitors to break up the coalition between the brand and the consumer (Oliver, 1999). Brand loyalty is considered to provide greater leverage to trade, condensed marketing costs and building an augmented market share (Aaker and Joachimsthaler, 2000). Based on it, the study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between brand loyalty and consumer's choice.

## Brand image

Brand image can be defined as the mental image that consumers have of a particular brand. According to Iglesias et al. (2011), there is a significant positive relationship between brand image and consumer preference. Similarly, Khan (2016) examined the impact of brand image and brand features on consumer choice of smartphones. The study discovered that brand image is positively related to consumer smartphone selection. Shehzad et al. (2014) assessed the influence of brand name on consumer choice and decision. The study found that there is a strong positive relationship between brand image and consumer choice. According to Sivanesan (2014), brand image and advertisement have a strong positive and significant relationship with consumer choice. Based on it, the study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between brand image and consumer's choice.

## Brand trust

Brand trust is defined as the average consumer's willingness to rely on the brand's ability to perform its stated function. Li (2017) examined the effects of brand image, perceived price, perceived quality, and

perceived value on the purchase intention towards sports and tourism products. The study found a positive relationship between brand trust and consumer purchase decision. Liang (2008) revealed that customers with higher level of trust over brand will lead to longer customers' loyalty. Similarly, the study showed that customer trust has a positive and significant impact on customers' loyalty. Likewise, Deng et al. (2010) also showed that there is a positive and significant relationship between brand trust and customer loyalty. Based on it, the study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between brand trust and consumer's choice.

### 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 150 observations. The dependent variable is CC (Consumer's choice). The independent variables are BP (Brand preference), BV (Brand value), BL (Brand loyalty), BI (Brand image), and BT (Brand trust).

| Variables | Mean  | S.D.  | BI      | BP      | BL      | BV      | BT      | CC |
|-----------|-------|-------|---------|---------|---------|---------|---------|----|
| BI        | 3.961 | 0.472 | 1       |         |         |         |         |    |
| BP        | 3.744 | 0.508 | 0.308** | 1       |         |         |         |    |
| BL        | 3.693 | 0.700 | 0.235** | 0.345** | 1       |         |         |    |
| BV        | 3.836 | 0.544 | 0.265** | 0.254** | 0.371** | 1       |         |    |
| BT        | 3.723 | 0.523 | 0.179** | 0.213** | 0.125*  | 0.229** | 1       |    |
| CC        | 3.719 | 0.634 | 0.185** | 0.173** | 0.171** | 0.233** | 0.373** | 1  |

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

Table 1 shows that brand trust has a positive relationship with consumer's choice. It indicates that increase in brand trust stimulates the consumer behavior to choose the specific brand phone. Similarly, brand image has a positive relationship with consumer's choice. It indicates that better brand image stimulates the consumer behavior to choose the specific brand phone. Likewise, brand preference has a positive relationship with consumer's choice. It indicates that higher brand preferences drive the consumer behavior to choose the specific brand phone. Similarly, brand loyalty has a positive relationship with consumer's choice indicating that higher brand loyalty stimulates the consumer behavior to choose the specific brand phone. Furthermore, brand value has a positive relationship with consumer's choice indicating that higher brand value drives the consumer behavior to choose the specific brand phone.



## Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it shows the regression results of brand image, brand preference, brand loyalty, customer satisfaction, brand value and brand trust on consumer's choice of smart phones.

**Table 2:** Regression results of brand image, brand preference, brand loyalty, customer satisfaction, brand value and brand trust on consumer's choice

The results are based on 150 observations using linear regression model. The model is  $CC = \beta_0 + \beta_1 BI + \beta_2 BP + \beta_3 BL + \beta_4 CS + \beta_5 BV + \beta_6 BT + e$ , where the dependent variable is CC (Consumer's choice). The independent variables are BP (Brand preference), BV (Brand value), BL (Brand loyalty), BI (Brand image), and BT (Brand trust).

| Model | Intercept           | Regression coefficients |                   |                  |                    |                    | Adj. $R_{bar}^2$ | SEE   | F-value |
|-------|---------------------|-------------------------|-------------------|------------------|--------------------|--------------------|------------------|-------|---------|
|       |                     | BI                      | BP                | BL               | BV                 | BT                 |                  |       |         |
| 1     | 2.474<br>(5.785)**  | 0.314<br>(2.931)**      |                   |                  |                    |                    | 0.055            | 0.618 | 8.589   |
| 2     | 2.929<br>(7.674)**  |                         | 0.211<br>(2.087)* |                  |                    |                    | 0.029            | 0.627 | 4.358   |
| 3     | 3.282<br>(11.829)** |                         |                   | 0.118<br>(1.601) |                    |                    | 0.017            | 0.63  | 2.562   |
| 4     | 2.563<br>(7.151)**  |                         |                   |                  | 0.301<br>(3.256)** |                    | 0.061            | 0.614 | 10.600  |
| 5     | 1.523<br>(4.658)**  |                         |                   |                  |                    | 0.590<br>(6.782)** | 0.232            | 0.555 | 45.998  |
| 6     | 2.315<br>(4.922)**  | 0.267<br>(2.184)*       | 0.093<br>(0.819)  |                  |                    |                    | 0.046            | 0.619 | 4.620   |
| 7     | 2.274<br>(4.758)**  | 0.261<br>(2.123)*       | 0.067<br>(0.545)  | 0.043<br>(0.52)  |                    |                    | 0.042            | 0.620 | 3.155   |
| 8     | 2.044<br>(4.195)**  | 0.185<br>(1.448)        | 0.043<br>(0.353)  | 0.032<br>(0.354) | 0.234<br>(1.975)*  |                    | 0.060            | 0.614 | 3.388   |
| 9     | 0.995<br>(2.085)*   | 0.088<br>(0.756)        | 0.034<br>(0.301)  | 0.008<br>(0.103) | 0.140<br>(1.291)   | 0.536<br>(5.745)** | 0.230            | 0.556 | 9.910   |

**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 choice is dependent variable.

Table 2 shows that the beta coefficients for brand value are positive with consumer's choice. It indicates that brand value has a positive impact on consumer's choice. This finding is consistent with the findings of Baek et al. (2010). Likewise, the beta coefficients for brand trust are positive with consumer's choice. It indicates that brand trust has a positive impact on consumer's choice. This finding is similar to the findings of Li (2017). Furthermore, the beta coefficients for brand loyalty are positive with consumer's choice. It indicates that brand loyalty has a positive impact on consumer's choice. This finding is similar to the findings of Erdumlu et al. (2017). Similarly, the beta coefficients for brand image are positive with

consumer's choice. It indicates that brand image has a positive impact on consumer's choice. This finding is similar to the findings of Khan (2016). Likewise, the beta coefficients for brand preference are positive with consumer's choice. It indicates that brand preference has a positive impact on consumer's choice. This finding is consistent with the findings of Goode et al. (2010).

## 4. Summary and conclusion

Brand image is the key driver of brand equity, which refers to consumer's general perception and feeling about a brand and has an influence on consumer behavior. Branding is a set of marketing and communication methods that help to distinguish a company or products from competitors, aiming to create a lasting impression in the minds of customers. The purpose of adopting a corporate brand is to have a unique and consistent look and feel across every medium. Brand preferences, brand value, brand loyalty, brand image and brand trust have been the crucial factors for influencing the consumer's choice.

This study attempts to examine the impact of brand image and corporate branding on consumer's choice of smart phones in Kathmandu Valley. The study is based on primary data gathered from 150 respondents.

The study showed that brand preferences, brand value, brand loyalty, brand image, and brand trust have positive impact on consumer's choice of smartphones. The study concluded that higher brand value and image drive the consumer behavior to choose the specific brand phone. The study also concluded that brand trust followed by brand value and brand preference is the most influencing factor that determines the consumer's choice of smart phones in Kathmandu valley.

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## Abstract

*This study examines the impact of e-commerce on consumer satisfaction, behavior and loyalty in the context of Nepal. Consumer behavior, consumer satisfaction, and consumer loyalty are the dependent variables. The selected independent variables are advertisements, consumer interest, delivery time, website quality, trustworthiness, and corporate image. The primary source of data is used to assess the impact of e-commerce on consumer satisfaction, behavior and loyalty in Nepal. The study is based on primary data with 139 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 e-commerce on consumer satisfaction, behavior and loyalty in Nepal.*

*The study showed that consumer interest has a positive impact on consumer satisfaction, behavior and loyalty. It indicates that higher the consumer's interest on online products, higher would be the consumer satisfaction, behavior and loyalty. Similarly, advertisement has a positive impact on consumer satisfaction, behavior and loyalty. It indicates that better advertisements in the online platforms lead to increase in consumer satisfaction, behavior and loyalty. Trustworthiness has a positive impact on consumer satisfaction, behavior and loyalty. It indicates that increase in trust leads to increase in consumer satisfaction, behavior and loyalty. In addition, corporate image has a positive impact on consumer satisfaction, behavior and loyalty. It indicates that better the corporate image, higher would be the consumer satisfaction, behavior and loyalty. Similarly, website quality has a positive impact on consumer satisfaction, behavior and loyalty. It indicates that better website quality leads to increase in consumer satisfaction, behavior and loyalty. Furthermore, delivery time has a positive impact on consumer satisfaction, behavior and loyalty. It indicates that quick delivery of the products leads to increase in consumer satisfaction, behavior and loyalty.*

**Keywords:** Consumer interest, consumer satisfaction, consumer loyalty, advertisements, consumer interest, delivery time, website quality, trustworthiness and corporate image.

# 1. Introduction

The internet has transformed the way business is performed. E-commerce is the business model where transactions and interactions of information and data are primarily conducted between businesses and between customers (Lin et al., 2016). It uses electronic means in order to complete those processes more effectively and efficiently across the spectrum of a business. Social media has changed the business model dramatically in the last ten years. Rather than depending on traditional techniques, consumers are increasingly turning to e-commerce to find information about various items and services (Schivinski and Dabrowski, 2016). People's need for interpersonal contacts has been reflected in the emergence of social media. Social activities have been integrated into the virtual realm of the web through e-commerce networking sites. Real-time messaging allows people to share information and make online social connections. This tendency indicates that e-commerce is an important aspect of organizations' online marketing strategies (Marriott et al., 2017). E-commerce includes financial and non-financial activities such as information dissemination, exchanging information about products and services. Successful e-commerce should be supported by Website design which determines the ability of a business to reap the benefits of online sales. The Website has been defined as the e-commerce application of network systems that has become an important phenomenon over the past decade (Zwass, 2003).

With the continuous upgrading and optimization of mobile terminal equipment such as smartphones, traditional e-commerce platforms are no longer satisfied with the needs of the contemporary market, so mobile e-commerce has emerged. Mobile e-commerce integrates more advanced mobile network communication technologies on the basis of traditional e-commerce. Its real-time transaction behavior is more efficient, convenient, and safe. It is not only compatible with traditional e-commerce models but also increases support for mobile device users (Hong et al., 2019). Businesses need to understand the factors that determine the quality in e-commerce to be able to achieve customer satisfaction and reduce perceived risk through improved quality (Lin, 2003). The rapid delivery of goods can improve customer satisfaction with e-commerce logistics, enhance customer loyalty to e-commerce companies, and promote the development of e-commerce companies (Kassim and Abdullah, 2010).

Kumar and Petersen (2006) examined how e-commerce has affected companies' abilities to serve the customers' needs and to raise their level of satisfaction. The study showed that there is a direct correlation between the use of e-commerce and improved customer service. In particular, e-commerce has improved the availability of information, reduced processing errors, reduced response times, lowered costs of services, and has effectively raised customer satisfaction and the level of service that customers expect to receive. Customers perceive e-commerce services with increasing trust and consider them increasingly reliable which is also confirmed by the growing tendencies in the forecasts of e-commerce services in Poland (Gajewska et al., 2019). Tzavlopoulos et al. (2019) investigated the quality in e-commerce and examined the relationships developed among its individual dimensions and satisfaction, perceived value, perceived risk and customer loyalty. The study found that quality overall has a positive and statistically significant relationship with perceived value, satisfaction and loyalty and negative with perceived risk. From the individual dimensions of quality, the study found that ease of use of websites, design, responsiveness and security lead to increased levels of perceived value, while ease of use, responsiveness and personalization lead to an increase in the overall satisfaction of consumers. Overall, the study documented that the high levels of quality lead to higher satisfaction and perceived value, mitigating perceived risk and positively influence the adoption of desirable consumer behaviors as reflected in customer loyalty.



The use of the internet as a shopping and purchasing medium has seen unprecedented growth. The global electronic market to dramatically impact commerce (Limayem et al., 2000). According to Butler and Pepard (1998), selling in cyberspace is very different from selling in physical markets, and it requires a critical understanding of consumer behavior and how new technologies challenge the traditional assumptions underlying conventional theories and models. Park and Kim (2003) found that the quality of the user interface affects the customer satisfaction directly, since it provides physical evidence of the service provider's competence as well as facilitating effortless use of the service. In addition, Gummerus et al. (2004) suggested that the quality of a user interface is expected to affect trust directly. Similarly, Roy et al. (2001) found that ease of navigation, interface design, and user guidance affect consumer trust. Online retailers may enhance customer satisfaction and loyalty by providing numerous advantages such as convenience, a well-designed user interface, customized information, a variety of product information, and competitive pricing (Verhoef and Langerak, 2001). Bharadwaj et al. (1999) argued that use of technology can get better information about their customer needs and wants. Ribbink et al. (2004) recommended five dimensions of quality, such as ease of use, site design, personalization, response and safety, which have a direct positive impact on trust and, hence increase customer satisfaction. Kim and Niehm (2009) considered information quality, interface quality and a sense of security for the site as the significant factors that determine the perceived satisfaction of the consumers.

According to Sullivan and Kim (2018), product evaluation is an important factor in online repurchasing intentions. The study showed that the value perceived by consumers is influenced by perceived quality, perceived competitive price, and website reputation. This, in turn, influenced overall online trust. The study concluded that the main predictors of online repurchase intentions were online trust and perceived value. Soopramanien (2011) assessed the development of consumer attitudes toward online shopping. The study also examined the concept of online-shopping skepticism, which reflects people's fear of online-shopping risks, even when they realize the benefits. The study showed that consumer perceptions of risk decreased as they gained experience and knowledge. Salem and Nor (2020) stated that perceived usefulness, risk taking propensity, perceived behavioral control and perceived lack of alternatives significantly influenced consumers' intention to adopt e-commerce. Perceived risk of online shopping constitutes a major factor that deters sales, and that creating situations where trust is stronger than perceived risk is imperative to increasing sales (Vos et al., 2014). Platform technological services, interaction/information communication and relationships have a significant influence on consumers' purchase intention (Curty and Zhang, 2013). Huang and Benyoucef (2013) discovered that the services function of social media platforms allows users to interact with each other and maintain online relationships, which is a significant predictor of behavioral intentions.

In the context of Nepal, Joshi (2019) examined the factors affecting customer satisfaction towards online shopping in Kathmandu Valley. The study revealed that perceived security and online payment process are positively correlated to customer satisfaction. It indicates that higher the level of perceived security and online payment process, higher would be the customer satisfaction. Trust and perceived security of social media networking play important role in consumer purchase decision (Aryal, 2012). The popularity of online shopping among Nepalese customers has increased with the cost-reduction of technology-based goods, the cost of internet services and easy access to the internet. At the same time, the convenient modes of payments, user-friendly and interactive shopping apps are further paving a pathway to unprecedented growth in the online shopping companies (Vaidya, 2019).

The above discussion shows that empirical evidences vary greatly across the studies on the impact of e-commerce on consumer satisfaction, behavior and loyalty. Though there are above mentioned empirical

evidences in the context of other countries and in Nepal, no such findings using more recent data exists 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 e-commerce on consumer satisfaction, behavior and loyalty in Nepal. Specifically, it examines the impact of advertisements, consumer interest, delivery time, website quality, trustworthiness, and corporate image on consumer satisfaction, behavior and loyalty 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 139 respondents through questionnaire. The respondent's views were collected on advertisements, consumer interest, delivery time, website quality, trustworthiness, and corporate image. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that consumer satisfaction, behavior, and loyalty depend on advertisements, delivery time, website quality, consumer interest, trustworthiness and corporate image is tested. Therefore, the models take the following form:

$$\begin{aligned} CS &= \beta_0 + \beta_1 AD + \beta_2 DT + \beta_3 CI + \beta_4 CO + \beta_5 WQ + \beta_6 TW + e_{it} \\ CL &= \beta_0 + \beta_1 AD + \beta_2 DT + \beta_3 CI + \beta_4 CO + \beta_5 WQ + \beta_6 TW + e_{it} \\ CB &= \beta_0 + \beta_1 AD + \beta_2 DT + \beta_3 CI + \beta_4 CO + \beta_5 WQ + \beta_6 TW + e_{it} \end{aligned}$$

Where,

- CS = Consumer satisfaction
- CB = Consumer behavior
- CL = Consumer loyalty
- AD = Advertisements
- DT = Delivery time
- CI = Consumer interest
- CO = Corporate image
- WQ = Website quality
- TW = Trustworthiness

Consumer interest 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 including "Interest and trust go hand in hand", "Celebrity endorsed products generate interest" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.892$ ).

Advertisements 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

including “There are way too many online advertisements”, “Online advertisements are more persuasive than traditional” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.905$ ).

Trustworthiness 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 including “Online shopping is trustworthy”, “Celebrity endorsed products generate interest” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.910$ ).

Corporate 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 6 items and sample items include “Online corporate image is also important”, “Corporate image helps in branding” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.890$ ).

Website 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 including “Website quality leads to the sales of product”, “A poor website quality will lead to loss of customers” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.894$ ).

Delivery time was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “A good delivery time makes customers happy”, “Delivery time impacts customer repurchase intentions” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.896$ ).

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 including “I am satisfied with the provided information”, “I am satisfied with the e-platforms” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.727$ ).

Consumer 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 “I enjoy online shopping”, “I have become lazier due to e-commerce” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.777$ ).

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 loyal to an online store”, “I only shop for branded items from online stores” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.732$ ).

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

## **Consumer interest**

Bowen and Chen (2001) revealed that brand orientation and consumer interest have positive impact on the buying intentions and consumer behavior. Similarly, Martin (1996) found that specific innovativeness and shopping orientations have positive impact on consumers’ buying behavior, and their interest towards online shopping. Moreover, Lin (2007) found a positive relationship between consumer interest on shop-

ping through online medium and consumer satisfaction. Furthermore, Hallowell (1996) showed that an individual's gender and interest influences consumers' intention to purchase through the internet. Based on this, the study develops the following hypothesis:

H<sub>1</sub>: There is positive relationship of consumer interest with consumer satisfaction, behavior, and loyalty.

## Advertisements

Bloemer and Kasper (1995) concluded that advertisement influence the consumers behavior and change their buying behaviors and re-think of the products they buy. Hameed (2013) showed that advertisement creates a positive impact on trust in the product and has significant influence on shopping tendency. Moreover, Hayati et al. (2020) found a positive relationship between advertisement and consumer satisfaction. Furthermore, Wu and Tseng (2015) revealed that advertisement has a positive impact on the desire for newness, awareness of different products and reaction to the stimuli of the consumer's promotions and preferences. Based on this, the study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship of advertisement with consumer satisfaction, behavior, and loyalty.

## Trustworthiness

Bagram and Khan (2012) concluded that the key to success lies in the hands of the particular online shop because the impact of the shop's trustworthiness is higher on customer satisfaction than the impact of general perceived risk. Likewise, Padmavathy et al. (2012) claimed that the quality of the product information provided by online intermediaries has a positive impact on trustworthiness and consumer behavior. The study also concluded that trustworthiness has positive association with consumer buying behavior. Similarly, Tran and Vu (2007) examined the relationship among e-service quality, e-trust, e-customer satisfaction and behavioral intentions of online shopping customers. The study showed that lack of trust has negative impact on customer loyalty. Based on it, the study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of trustworthiness with consumer satisfaction, behavior, and loyalty.

## Corporate image

Lee (2019) showed that corporate image has a positive impact on core service, disconfirmation, customer satisfaction and customer loyalty. Tu and Chang (2012) showed that corporate image and customer satisfaction, as a function of service quality, have significant positive impact on customer loyalty. Chang and Fong (1998) revealed that corporate image is consequently assumed to have an impact on customers' choice of company when service attributes are difficult to evaluate. Upamannu and Sankpal (2014) indicated that corporate image has a significant positive impact on customer loyalty. Ene and Ozkaya (1998) concluded that the product quality and corporate image have a direct impact on performance, and closely linked to customer satisfaction, customer loyalty, and repurchase intentions. Based on it, the study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship of corporate image with consumer satisfaction, behavior, and loyalty.

## Website quality

Kim and Stoel (2004) suggested that customer satisfaction success is determined by system quality, website quality, individual impact and organizational impact. Furthermore, Ford et al. (2013) revealed that website quality has a positive impact on consumer satisfaction. Ghasemaghaci and Hassanein (2015) concluded that fast response time and quality of website has strong positive influence on consumer satisfaction on online shopping. Furthermore, Chi (2018) suggested that convenience, web site easiness, time saving and effort significantly influence consumer satisfaction. Based on it, the study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of website quality with consumer satisfaction, behavior, and loyalty.

## Delivery Time

Sivadas and Baker-Prewitt (2000) showed that shipping fees and delivery time have significantly positive impact on consumer's purchase decisions and behavior. Moreover, Joudeh and Dandis (2006) revealed that online consumers are quite sensitive to delivery time, and has a strong impact on consumer satisfaction and repurchase intentions. In addition, Hasfar et al. (2020) concluded that the delivery-time and delivery-fee involves a crucial attribute with a clear impact on consumer behavior. Furthermore, YuSheng and Ibrahim (2019) demonstrated that previous online purchasing experiences and delivery time have a direct impact on online purchasing behavior. Based on it, the study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship of delivery time with consumer satisfaction, behavior, 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 correlation coefficient between dependent and independent variables. The correlation coefficients are based on 139 observations. The dependent variables are CS (Consumer satisfaction) CB (Consumer behavior) and CL (Consumer loyalty). The independent variables are CI (Consumer interest), AD (Advertisements), TW (Trustworthiness), CO (Corporate image), WQ (Website quality) and DT (Delivery time).

| Variables | SD    | Mean  | CS      | CB      | CL      | CI      | AD      | TW      | CO      | WQ      | DT |
|-----------|-------|-------|---------|---------|---------|---------|---------|---------|---------|---------|----|
| CS        | 0.947 | 3.117 | 1       |         |         |         |         |         |         |         |    |
| CB        | 0.843 | 3.313 | 0.494** | 1       |         |         |         |         |         |         |    |
| CL        | 0.884 | 3.182 | 0.460** | 0.463** | 1       |         |         |         |         |         |    |
| CI        | 0.954 | 3.588 | 0.153** | 0.459** | 0.208** | 1       |         |         |         |         |    |
| AD        | 0.840 | 3.316 | 0.283** | 0.489** | 0.443** | 0.465** | 1       |         |         |         |    |
| TW        | 0.819 | 3.257 | 0.529** | 0.485** | 0.344** | 0.29**  | 0.394** | 1       |         |         |    |
| CO        | 0.859 | 3.420 | 0.438** | 0.608** | 0.343** | 0.544** | 0.414** | 0.451** | 1       |         |    |
| WQ        | 0.969 | 3.715 | 0.18**  | 0.331** | 0.266** | 0.375** | 0.275** | 0.298** | 0.502** | 1       |    |
| DT        | 1.074 | 3.713 | 0.212** | 0.445** | 0.213** | 0.509** | 0.375** | 0.27**  | 0.466** | 0.554** | 1  |

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

Table 1 shows that consumer interest is positively correlated to consumer satisfaction. It indicates that higher the consumer's interest, higher would be the consumer satisfaction. Similarly, advertisement is positively correlated to consumer satisfaction. It indicates that better advertisements lead to increase in consumer satisfaction. Likewise, trustworthiness is positively correlated to consumer satisfaction. It indicates that increase in trust leads to increase in consumer satisfaction. In addition, corporate image is positively correlated to consumer satisfaction. It indicates that better the corporate image, higher would be the consumer satisfaction. Similarly, website quality is positively correlated to consumer satisfaction. It indicates that better website quality leads to increase in consumer satisfaction. Furthermore, delivery time is positively correlated to consumer satisfaction. It indicates that quick delivery of the products leads to increase in consumer satisfaction.

In addition, consumer interest is positively correlated to consumer behavior. It indicates that higher interest on the product stimulates the buying behavior of the consumer. Similarly, advertisement is positively correlated to consumer behavior. It indicates that better advertisements stimulate the buying behavior of the consumer. Likewise, trustworthiness is positively correlated to consumer behavior. It indicates that increase in trust on the product stimulates the buying behavior of the consumer. In addition, corporate image is positively correlated to consumer behavior. It indicates that better corporate image stimulates the buying behavior of the consumer. Similarly, website quality is positively correlated to consumer behavior. It indicates that better website quality stimulates the buying behavior of the consumer. Furthermore, delivery time is positively correlated to consumer behavior. It indicates that quick delivery of the products stimulates the buying behavior of the consumer.

Moreover, consumer interest is positively correlated to consumer loyalty. It indicates that higher the consumer's interest, higher would be the consumer loyalty. Similarly, advertisement is positively correlated to consumer loyalty. It indicates that better advertisements lead to increase in consumer loyalty. Likewise, trustworthiness is positively correlated to consumer loyalty. It indicates that increase in trust leads to increase in consumer loyalty. In addition, corporate image is positively correlated to consumer loyalty. It indicates that better the corporate image, higher would be the consumer loyalty. Similarly, website quality is positively correlated to consumer loyalty. It indicates that better website quality leads to increase in consumer loyalty. Furthermore, delivery time is positively correlated to consumer loyalty. It indicates that quick delivery of the products leads to increase in consumer loyalty.

## 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 advertisements, corporate image, consumer interest, trustworthiness, delivery time, and website quality on consumer satisfaction.

**Table 2:** Estimated regression results of consumer interest, advertisements, delivery time, trustworthiness, corporate image, and website quality on consumer satisfaction

The results are based on 139 observations using a linear regression model. The model is  $CS = \beta_0 + \beta_1 AD + \beta_2 DT + \beta_3 CI + \beta_4 CO + \beta_5 WQ + \beta_6 TW + e_i$ , where the dependent variable is CS (Consumer satisfaction). The independent variables are CI (Consumer interest), AD (Advertisements), TW (Trustworthiness), CO (Corporate image), WQ (Website quality) and DT (Delivery time).

| Models | Intercept           | Regression coefficients of |                     |                     |                     |                  |                  | Adj.R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|--------|---------------------|----------------------------|---------------------|---------------------|---------------------|------------------|------------------|-----------------------------------|-------|---------|
|        |                     | CI                         | AD                  | TW                  | CO                  | WQ               | DT               |                                   |       |         |
| 1      | 1.788<br>(6.126) ** | 0.371                      |                     |                     |                     |                  |                  | 0.133                             | 0.881 | 22.220  |
|        |                     | (4.714) **                 |                     |                     |                     |                  |                  |                                   |       |         |
| 2      | 1.443<br>(4.899) ** |                            | 0.505               |                     |                     |                  |                  | 0.195                             | 0.849 | 34.402  |
|        |                     |                            | (5.865) **          |                     |                     |                  |                  |                                   |       |         |
| 3      | 0.386<br>(1.693) ** |                            |                     | 0.839               |                     |                  |                  | 0.523                             | 0.654 | 152.498 |
|        |                     |                            |                     | (12.349) **         |                     |                  |                  |                                   |       |         |
| 4      | 0.971<br>(3.559) ** |                            |                     |                     | 0.628               |                  |                  | 0.32                              | 0.781 | 65.831  |
|        |                     |                            |                     |                     | (8.114) **          |                  |                  |                                   |       |         |
| 5      | 1.57<br>(5.415) **  |                            |                     |                     |                     | 0.417            |                  | 0.176                             | 0.860 | 30.412  |
|        |                     |                            |                     |                     |                     | (5.515) **       |                  |                                   |       |         |
| 6      | 1.77<br>(6.676) **  |                            |                     |                     |                     |                  | 0.363            | 0.163                             | 0.866 | 27.969  |
|        |                     |                            |                     |                     |                     |                  | (5.289) **       |                                   |       |         |
| 7      | 1.382<br>(4.496) ** | 0.082                      | 0.435               |                     |                     |                  |                  | 0.192                             | 0.851 | 17.389  |
|        |                     | (0.707)                    | (3.308) **          |                     |                     |                  |                  |                                   |       |         |
| 8      | 1.317<br>(4.301) ** | 0.077                      | 0.387               | 0.213               |                     |                  |                  | 0.208                             | 0.843 | 13.033  |
|        |                     | (0.541)                    | (2.922) **          | (1.909)             |                     |                  |                  |                                   |       |         |
| 9      | 1.195<br>(3.760) ** | 0.093<br>(0.656)           | 0.36<br>(2.699) **  | 0.195<br>(1.394)    | 0.09<br>(0.638)     |                  |                  | 0.207                             | 0.843 | 13.033  |
| 10     | 0.936<br>(3.169) ** | 0.258<br>(1.935)           | 0.256<br>(2.067) ** | 0.828<br>(5.157) ** | 0.077<br>(0.556)    | 0.077<br>(0.578) |                  | 0.339                             | 0.770 | 15.159  |
| 11     | 0.416<br>(1.626)    | 0.128<br>(1.136)           | 0.068<br>(6.11) **  | 0.768<br>(7.649) ** | 0.435<br>(2.947) ** | 0.106<br>(0.916) | 0.046<br>(0.411) | 0.539                             | 0.643 | 27.845  |

**Notes:**

- Figures in parenthesis are t-value
- 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 consumer interest are positive with consumer satisfaction. It indicates that consumer interest has a positive impact on consumer satisfaction. This finding is similar to the findings of Bowen and Chen (2001). Likewise, the beta coefficients for advertisements are positive with consumer satisfaction. It implies that advertisements have a positive impact on consumer satisfaction. This finding is consistent with the findings of Bloemer and Kasper (1995). Similarly, the beta coefficients for trustworthiness are positive with consumer satisfaction. It means that trustworthiness has a positive impact on consumer satisfaction. This finding is consistent with the findings of Bagram and Khan (2012). Furthermore, the beta coefficients for corporate image are positive with consumer satisfaction. It indicates that corporate image has a positive impact on consumer satisfaction. This finding is similar to the findings of Lee (2019). Likewise, the beta coefficients for website quality are positive with consumer



satisfaction. It implies that website quality has a positive impact on consumer satisfaction. This finding is consistent with the findings of Kim and Stoel (2004). Similarly, the beta coefficients for delivery time are positive with consumer satisfaction. It indicates that delivery time has a positive impact on consumer satisfaction. This finding is similar to the findings of Sivadas and Baker–Prewitt (2000).

Table 3 presents the regression results of advertisements, corporate image, consumer interest, trustworthiness, delivery time, and website quality on consumer behavior.

**Table 3:** Estimated regression results of consumer interest, advertisements, delivery time, trustworthiness, corporate image, and website quality on consumer behavior

The results are based on 139 observations using a linear regression model. The model is  $CB = \beta_0 + \beta_1 AD + \beta_2 DT + \beta_3 CI + \beta_4 CO + \beta_5 WQ + \beta_6 TW + e_i$ , where the dependent variable is CB (Consumer behavior). The independent variables are CI (Consumer interest), AD (Advertisements), TW (Trustworthiness), CO (Corporate image), WQ (Website quality) and DT (Delivery time).

| Models | Intercept          | Regression coefficients of |                     |                     |                     |                     |                     | Adj.R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|--------|--------------------|----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------------------|-------|---------|
|        |                    | CI                         | AD                  | TW                  | CO                  | WQ                  | DT                  |                                   |       |         |
| 1      | 1.057<br>(5.372)** | 0.629<br>(11.872)**        |                     |                     |                     |                     |                     | 0.504                             | 0.594 | 140.954 |
| 2      | 0.913<br>(4.493)** |                            | 0.724<br>(12.181)** |                     |                     |                     |                     | 0.516                             | 0.586 | 148.381 |
| 3      | 0.817<br>(4.147)** |                            |                     | 0.767<br>(13.075)** |                     |                     |                     | 0.552                             | 0.564 | 170.966 |
| 4      | 0.429<br>(2.843)** |                            |                     |                     | 0.843<br>(19.686)** |                     |                     | 0.737                             | 0.432 | 387.54  |
| 5      | 0.983<br>(4.969)** |                            |                     |                     |                     | 0.627<br>(12.172)** |                     | 0.516                             | 0.586 | 148.161 |
| 6      | 1.133<br>(6.592)** |                            |                     |                     |                     |                     | 0.587<br>(13.212)** | 0.557                             | 0.561 | 174.557 |
| 7      | 0.657<br>(0.197)** | 0.345<br>(0.074)           | 0.428<br>(0.084)    |                     |                     |                     |                     | 0.579                             | 0.546 | 96.053  |
| 8      | 0.183<br>(0.183)** | 0.299<br>(0.064)           | 0.170<br>(0.082)**  | 0.059<br>(0.006)    |                     |                     |                     | 0.689                             | 0.470 | 102.728 |
| 9      | 0.037<br>(0.242)** | 0.018<br>(0.278)           | 0.141<br>(2.078)*   | 0.246<br>(4.038)**  | 0.569<br>(7.874)**  |                     |                     | 0.786                             | 0.390 | 127.365 |
| 10     | 0.041<br>(0.155)** | 0.021<br>(0.065)           | 0.142<br>(0.068)**  | 0.246<br>(0.061)    | 0.057<br>(0.085)    | 0.013<br>(0.063)    |                     | 0.784                             | 0.391 | 101.173 |
| 11     | 0.066<br>(0.425)** | 0.011<br>(0.156)           | 0.139<br>(2.049)**  | 0.249<br>(4.091)**  | 0.548<br>(6.265)**  | 0.059<br>(0.844)    | 0.096<br>(1.419)    | 0.786                             | 0.390 | 85.288  |

**Notes:**

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

The regression results show that the beta coefficients for consumer interest are positive with consumer behavior. It indicates that consumer interest has a positive impact on consumer behavior. This finding is

similar to the findings of Martin (1996). Likewise, the beta coefficients for advertisements are positive with consumer behavior. It implies that advertisements have a positive impact on consumer behavior. This finding is consistent with the findings of Tran and Vu (2007). Similarly, the beta coefficients for trustworthiness are positive with consumer behavior. It means that trustworthiness has a positive impact on consumer behavior. This finding is consistent with the findings of Padmavathy et al. (2012). Furthermore, the beta coefficients for corporate image are positive with consumer behavior. It indicates that corporate image has a positive impact on consumer behavior. This finding is similar to the findings of Upamannyu and Sankpal (2014). Likewise, the beta coefficients for website quality are positive with consumer behavior. It implies that website quality has a positive impact on consumer behavior. This finding is consistent with the findings of Ford et al. (2013). Similarly, the beta coefficients for delivery time are positive with consumer behavior. It indicates that delivery time has a positive impact on consumer behavior. This finding is similar to the findings of Joudeh and Dandis (2006).

Table 4 presents the regression results of advertisements, corporate image, consumer interest, trustworthiness, delivery time, and website quality on consumer loyalty.

**Table 4:** Estimated regression results of consumer interest, advertisements, delivery time, trustworthiness, corporate image, and website quality on consumer loyalty

The results are based on 139 observations using a linear regression model. The model is  $CL = \beta_0 + \beta_1 AD + \beta_2 DT + \beta_3 CI + \beta_4 CO + \beta_5 WQ + \beta_6 TW + e_i$ , where the dependent variable is CL (Consumer loyalty). The independent variables are CI (Consumer interest), AD (Advertisements), TW (Trustworthiness), CO (Corporate image), WQ (Website quality) and DT (Delivery time).

| Models | Intercept          | Regression coefficients of |                     |                    |                    |                    |                    | Adj.R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|--------|--------------------|----------------------------|---------------------|--------------------|--------------------|--------------------|--------------------|-----------------------------------|-------|---------|
|        |                    | CI                         | AD                  | TW                 | CO                 | WQ                 | DT                 |                                   |       |         |
| 1      | 1.36<br>(5.537)**  | 0.508<br>(7.672)**         |                     |                    |                    |                    |                    | 0.295                             | 0.742 | 58.862  |
| 2      | 0.811<br>(3.592)** |                            | 0.715<br>(10.838)** |                    |                    |                    |                    | 0.458                             | 0.651 | 117.452 |
| 3      | 1.09<br>(4.382)**  |                            |                     | 0.642<br>(8.675)** |                    |                    |                    | 0.35                              | 0.713 | 75.248  |
| 4      | 1.058<br>(4.281)** |                            |                     |                    | 0.621<br>(8.868)** |                    |                    | 0.36                              | 0.707 | 78.643  |
| 5      | 1.144<br>(4783)**  |                            |                     |                    |                    | 0.649<br>(8.807)** |                    | 0.357                             | 0.709 | 77.558  |
| 6      | 1.592<br>(6.861)** |                            |                     |                    |                    |                    | 0.428<br>(7.138)** | 0.266                             | 0.757 | 50.956  |
| 7      | 0.754<br>(0.235)** | 0.076<br>(0.089)           | 0.65<br>(0.101)     |                    |                    |                    |                    | 0.467                             | 0.651 | 58.989  |
| 8      | 0.472<br>(0.246)** | 0.049<br>(0.086)           | 0.496<br>(0.110)    | 0.273<br>(0.088)   |                    |                    |                    | 0.489                             | 0.632 | 44.990  |
| 9      | 0.42<br>(0.246)**  | 0.05<br>(0.103)            | 0.486<br>(0.109)    | 0.198<br>(0.098)   | 0.201<br>(0.116)   |                    |                    | 0.496                             | 0.627 | 34.994  |
| 10     | 0.348<br>(0.245)** | 0.086<br>(0.103)           | 0.468<br>(0.108)    | 0.194<br>(0.097)   | 0.048<br>(0.135)   | 0.213<br>(0.099)   |                    | 0.51                              | 0.619 | 29.689  |
| 11     | 0.303<br>(1.238)** | 0.03<br>(0.281)            | 0.473<br>(4.417)**  | 0.188<br>(1.962)*  | 0.102<br>(0.736)   | 0.297<br>(2.677)** | 0.174<br>(1.626)   | 0.516                             | 0.615 | 25.487  |

### Notes:

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

The regression results show that the beta coefficients for consumer interest are positive with consumer loyalty. It indicates that consumer interest has a positive impact on consumer loyalty. This finding is similar to the findings of Hallowell (1996). Likewise, the beta coefficients for advertisements are positive with consumer loyalty. It implies that advertisements have a positive impact on consumer loyalty. This finding is consistent with the findings of Wu and Tseng (2015). Similarly, the beta coefficients for trustworthiness are positive with consumer loyalty. It means that trustworthiness has a positive impact on consumer loyalty. This finding is consistent with the findings of Tran and Vu (2007). Furthermore, the beta coefficients for corporate image are positive with consumer loyalty. It indicates that corporate image has a positive impact on consumer loyalty. This finding is similar to the findings of Ene and Ozkaya (1998). Likewise, the beta coefficients for website quality are positive with consumer loyalty. It implies that website quality has a positive impact on consumer loyalty. This finding is consistent with the findings of Chi (2018). Similarly, the beta coefficients for delivery time are positive with consumer loyalty. It indicates that delivery time has a positive impact on consumer loyalty. This finding is similar to the findings of YuSheng and Ibrahim (2019).

## 4. Summary and conclusion

The rapid use of social media such as blogs and other social networking sites and media-sharing technology is changing the way firms respond to consumer's needs and wants. Social media such as Facebook, Twitter and YouTube are dynamic tools that facilitate online relationships. It is a relatively low-cost form of marketing and allows organizations to engage in direct and end-user contact. All online platforms are doing their hardest to attract the attention of the targeted market, hence they are investing more in the online world than they used to. Because their businesses rely on the online market, e-commerce sites are now constantly working on improving their websites.

This study attempts to examine the impact of e-commerce on consumer satisfaction, behavior and loyalty in Nepal. The study is based on primary data with 139 observations.

The study showed that advertisements, corporate image, trustworthiness, delivery time, consumer interest and delivery time have a positive impact on the impact of consumer satisfaction, behavior, and loyalty in Nepal. The study concluded that trustworthiness is the most influencing factor that explains the changes in the level of consumer satisfaction. The study also concluded that corporate image is the most influencing factor that explains the consumer behavior in the context of Nepal.

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## Abstract

*This study examines the factors influencing consumer buying behavior of vegetables products in Kathmandu Valley. Consumer buying behavior is the dependent variable. The selected independent variables are price, health, knowledge, environment concern and availability. The primary source of data is used to assess the opinions of the respondents regarding consumer buying behavior of vegetables products in Kathmandu Valley. The study is based on primary of 22 locations inside Kathmandu Valley with 150 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of different factors on consumer buying behavior of vegetables products in Kathmandu Valley.*

*The study showed that health consciousness has positive impact on consumer buying behavior. It indicates that health consciousness stimulates the consumer buying behavior. Similarly, price has positive impact on consumer buying behavior. It indicates that fair price stimulates the buying behavior of the consumer. Similarly, environment concern has positive impact on consumer buying behavior. It indicates that higher level of environment concern drives the buying behavior of the consumer. The study also showed that availability has positive impact on consumer behavior. It indicates that easily availability of the vegetables stimulates the consumer buying behavior. Furthermore, knowledge has positive impact on consumer buying behavior. It indicates that good knowledge about the importance of green vegetables drives the consumer buying behavior.*

**Keywords:** Price, health, knowledge, environment concern, buying behavior, consumers, organic and availability.

# 1. Introduction

In today's world, the customer's demand and the power of the retailers is tremendously growing due to competitive environment and changing business. It is vital to have a sustainable relationship with customers for the survival and success of the producers. The customer purchase decision is now becoming a complex process. Consumer's behavior, perceptions and attitudes determine their purchase intentions. To evaluate and access a specific product, purchase behavior becomes a key point for consumers. Most business firms are realizing that if they do not have competitive strength, they cannot survive. A business cannot succeed by supplying products and services that are not properly designed to serve the needs of the customers. The entire business has to be seen from the point of view of the customer. A company's business depends on its ability to create and retain its customers (Guha, 2013). Consumer buying behavior refers to the behavior of the ultimate consumer. It refers to the selection, purchase and consumption of goods and services for the satisfaction of their wants (Ramya and Ali, 2016). Today's business environment is highly competitive and rapidly changing. If firm wants to succeed in its goals, then it has to do a continuous observation of the consumer behavior and their preference because consumers are the kings in the business world (Anojan and Subaskaran, 2015).

The decision in buying fruits and vegetables is based on analysis of cognitive and emotional elements with a little effect from advertising or other campaigns and they value freshness, appearance and price more than other characteristics (Vukasovic, 2015). Herath (2019) determined the behavior during purchasing of vegetables. The results of this study concluded that the behavior of consumers is affected by the price, health factors, the quality of vegetables, home gardening and the situation. Consumers prefer to purchase a variety of vegetables including the organically produced. The choice of the market place and vegetables, frequency of shopping, amount spend on vegetables and factors considered during purchasing vary from one consumer to another. Consumers either seek to purchase environmentally friendly food products or become health conscious about what they eat increasing the demand for organic food in the market (Anuradha, 2015). Ramappa and Manjunatha (2015) analysed the attitudes of the consumers in Bangalore towards buying of fruits and vegetables and their choice of retail outlets. The study found that among all variables, quality and prices were major accountable factors for buying fruits and vegetables at organized retail shops. Moreover, Shim et al. (1998) showed the special role of aesthetics and food safety in the buying motivations of Japanese consumers. Consequently, the study showed insignificant relationship of prices and convenience with the buying motivations of the consumers.

Nandi et al. (2016) analyzed the factors influencing consumers' willingness to pay for organic fruits and vegetables in India. The study concluded that the reasons behind higher willingness to pay a premium price for organic vegetables than for organic fruits is due to inadequate availability of organic fruits in the market. In the modern era of globalization, it has become a challenge to keep the consumers in fold and even keep our natural environment safe and that is the biggest need of the time. The green movement has been expanding rapidly in the world. With regards to this, consumer is taking responsibility and doing the right things. Consumer awareness and motivation continue to drive change in the marketplace, notably through the introduction of eco-friendlier products. Customer's attitudes are changing towards the environment to encourage innovation for conservation and the benefits from this source of innovation are certain to outlive our current generation (Maheshwari, 2014). Chang and Wildt (1994) also found that customer perceived value is one of the key contributors to purchase intention because higher perceived value of a service provider will create the behavioral intention to purchase and patronize the product or services offered which will directly increase the firm's sale and revenue.

According to Zeithaml et al. (1996), customers would remain loyal as long as the perceived value of products/services is relatively greater than that of competitors' offerings. Many consumers are concerned about environmental safety, health and also about cost. Cost is a crucial factor when the willingness to pay a premium for green products is concerned and there is a lesser brand awareness of eco-friendly. Bang et al. (2000) found those consumers who were more concern about environmental issues will buy green products even its price was higher than less eco-friendly products. Boztepe (2012) found that if the price of the green product was kept lower, the consumers will be encouraged to buy the green product. Suki (2013) found that consumers' awareness of price significantly influences their purchasing decision. Tarkiainen and Sundqvist (2005) found that availability of a product has a positive relation with green purchase intention and behaviour. Similarly, Sharaf and Perumal (2018) found a significant relationship between green products availability and purchasing behavior of green products.

According to Terpstra and Verbeeten (2014), satisfied customers tend to be loyal and willing to purchase more of a firm's services at higher prices. Similarly, Lin and Wang (2006) found that customer loyalty is affected by perceived value, trust, habit, and customer satisfaction. The study also showed that customer satisfaction plays a crucial intervening role in the relationship of perceived value and trust to loyalty. Likewise, Aryal et al. (2009) showed a positive and significant effect of attitude toward organic foods on a willingness to pay. The more positive consumer attitudes towards green products, the higher the willingness to pay higher prices on green products. Borin et al. (2013) found that consumer perception of product quality, value and purchase intentions do not differ significantly between products with positive environmental messages and those without any message. Mainieri et al. (1997) found a relationship of environmental beliefs with consumer purchasing behavior. The price is not the main factor in preventing consumers from purchasing green products if they are pro-environment (Chyong et al., 2006). According to Anderson and Mittal (2000), there is a positive relationship between consumers' environmental beliefs and their attitudes and behavior towards their buying decision. Balderjahn (1988) found that a consumer has a positive attitude towards ecofriendly products which helps them in having an ecologically conscious living. Kaufmann et al. (2012) found that most of the consumers, who were aware of environmental issues, were adherent of their environment and society. They also make an effort to buy products that were less damaging to their environment and community while purchasing them.

The main reasons that consumers' willingness to pay for organic vegetables are environmental attitudes of consumers, the production origin of the product, consumer's economic characteristic and to lesser extent consumer's socio-demographic characteristics. In particular, consumer's health attitudes have significant role in explaining consumer's organic purchases (Schifferstein and Ophuis, 1998). Price fairness has a significant positive effect on customer retention. The perceptions of customers of a given price can have a direct relationship with their decision to buy a product (Amaldoss and Jain, 2005). According to Urbany et al. (1996), when consumer makes a purchase, the value of the purchased item must be greater than its costs. In other words, the perceived benefits of a product must exceed the expenses of acquiring it. Due to the importance of cost and service charges, customers are most likely to commit to a company that provides cheaper services (Mokhtar et al., 2011).

In the context of Nepal, Thapa (2019) concluded that the purchase intention significantly varies by age and occupation of the respondent. The study also found that consumer's knowledge is not so manifest about the various benefits of green products. A significant perceptual difference has been found among the consumers with different age and level of education in this regard. The study also explored that consumers' have assorted opinion concerning the price of the green products. Consumers' willingness

to purchase is influenced by various factors. The major factors identified by the consumers are lack of information available to consumers, higher prices over those of conventional foods, and the limited and erratic domestic supply (Aryal et al., 2009).

The above discussion reveals that the empirical evidences vary greatly across the studies concerning on consumer buying behavior of vegetables products. 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 examine the factors influencing consumer buying behavior of vegetables products in Kathmandu Valley. Specifically, it examines the impact of price, health, knowledge, environment concern and availability on consumer buying behavior of vegetables products 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 were gathered from 150 respondents through questionnaire. The respondents' views were collected on price, health, knowledge, environmental concern and availability of vegetables in Kathmandu Valley. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that consumer buying behavior depends on price, health, knowledge, environmental concern and availability. Therefore, the model takes the following form:

$$CB = \beta_0 + \beta_1 P + \beta_2 H + \beta_3 E + \beta_4 K + \beta_5 A + e$$

Where,

CB = Consumers buying behavior

P = Price

H = Health

E = Environment concern

K = Knowledge

A = Availability

Consumer buying 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 are 5 items and sample items include "I make an impulse buying decision if the price of the organic vegetable is reasonable," "I am willing to recommend organic vegetables rather than non-organic to my family" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.709$ ).

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 are 5 items and sample items include "When I

buy organic vegetables, I like to be sure that I am getting my money's worth," "If I get organic vegetables at a lower price, I prefer organic vegetables over non-organic" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.737$ ).

Health 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 "Organic vegetables add nutritional value to my body", "Buying organic food means it is pesticide free" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.919$ ).

Knowledge was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Organic foods are produced without using any chemicals and preservatives", "Such products are grown using organic fertilizers" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.700$ ).

Environment concern 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 "Organic vegetables do not produce water pollution", "Organic farming systems are better for the environment" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.789$ ).

Availability was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Organic vegetables are available in the shop where I usually shop", "There is a good variety of organic vegetables in the major supermarkets" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.789$ ).

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

## Price

According to Volckner and Hofmann (2007), price is not just assumed as a cost in consumers' perspective but also as a cue to product quality. Al-Salamini and Al-Hassan (2016) measured the impact of pricing strategies on consumers' psychology and on their buying behavior accordingly. The findings show that there is a positive relationship between prices and consumer buying behavior. Environmentally preferable products are sometimes more expensive to purchase than other alternative products. Green consumers have been shown to be willing to pay a higher price for environmentally friendly products (Laroche et al., 2001). A high price of green product is an indicator of environmental performance, because less polluting products are more costly to produce (Mahenc, 2008) Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between price and consumer buying behavior.

## Health consciousness

Tran et al. (2020) examined the roles of health consciousness and service quality toward customer purchase decision. The study found that consumers have paid no attention to the marketing mix factors, but they

care much about service quality and health consciousness. Similarly, Hoque et al. (2018) showed that consumers' health consciousness has a positive impact on perceived knowledge, belief, and attitude. In addition, belief has significant influence on both the attitude and purchase intention. Parashar et al. (2019) revealed that a high percentage of consumers believed that organic food was healthier than conventional food. Concerns have influence over consumer attitude toward organic food. Moreover, Bhalerao and Sharma (2017) found that there is a statistically positive relationship between health care practice and the consumption of organic food. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between health consciousness and consumer buying behavior.

## Knowledge

Knowledge is a characteristic that can affect the phases of decision process. It can be related to how much information is being used in making decisions (Brucks, 1985). According to Gracia and de Magistris (2007), with higher knowledge about organic foods, there is a greater probability of buying organic products among the consumers. Zepeda et al. (2006) indicated that organic shoppers were more knowledgeable than conventional shoppers' groups. Magistris and Gracia (2008) found that larger information on the organic products market has a positive influence on consumers' attitude towards organic vegetables products. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between knowledge and consumer buying behavior.

## Environment concern

Mishal et al. (2017) examined the dynamics of environmental consciousness and green purchase behaviour. The study showed that environmental consciousness has a positive influence on purchase behavior of the consumers towards green products. Laroche et al. (2001) explained that consumer attitudes towards the environment are the most important predictors of their willingness to pay for organic food. Consumers who are willing to buy organic foods and pay a high premium, were more environment conscious and concern about environment- friendly diet (Gil et al., 2011). Kautish et al. (2019) showed that there is a significant positive influence of environmental consciousness and recycling intentions on green purchase behavior. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between environmental concern and willingness to pay.

## Availability

Rise in consumer interest often results from increased availability and range of products available to consumers from retailers (Padel et al., 2005). Similarly, availability and taste quality play major role in influencing consumer behavior because it provides a measure by which the price premium can be justified (Magnusson et al., 2001). Moreover, Hossain and Lim (2016) evaluated the current status of consumers' buying behavior towards organic foods in the emerging market. The study found that government support and policy, perceived beliefs and attitudes, knowledge and availability have a significant positive relationship with consumer behavior towards organic foods. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship between availability and consumer buying behavior.

### 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 correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 150 observations. The dependent variable is CB (Consumer buying behavior). The independent variables are P (Price), H (Health), K (Knowledge), EC (Environment concern), and A (Availability).

| Variables | Mean  | SD    | CB      | P       | H       | K       | EC      | A |
|-----------|-------|-------|---------|---------|---------|---------|---------|---|
| CB        | 3.777 | 0.641 | 1       |         |         |         |         |   |
| P         | 3.575 | 0.626 | 0.605** | 1       |         |         |         |   |
| H         | 3.064 | 0.813 | 0.641** | 0.678** | 1       |         |         |   |
| K         | 3.615 | 0.683 | 0.550** | 0.529** | 0.643** | 1       |         |   |
| EC        | 3.603 | 0.633 | 0.574** | 0.597** | 0.652** | 0.607** | 1       |   |
| A         | 3.915 | 0.775 | 0.434** | 0.539** | 0.480** | 0.433** | 0.605** | 1 |

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

The study reveals that price is positively correlated to consumer buying behavior. It indicates that fair price stimulates the buying behavior of the consumer. Similarly, environment concern is positively correlated to consumer buying behavior. It indicates that higher level of environment concern drives the buying behavior of the consumer. The study also shows that availability is positively related to consumer behavior. It indicates that easily availability of the vegetables stimulates the consumer buying behavior. The result shows that knowledge is positively correlated to consumer buying behavior. It indicates that good knowledge about the importance of green vegetables drives the consumer buying behavior. Likewise, the result shows that health consciousness is positively correlated to consumer buying behavior. It indicates that health consciousness stimulates the consumer buying behavior.

#### 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 price, health, knowledge, environment concern and availability in consumer buying behavior.



**Table 2:** Estimated regression results of price, health, knowledge, environment concern, and availability with consumer buying behavior in Kathmandu Valley

The results are based on 150 observations using linear regression model. The model is  $CB = \beta_0 + \beta_1 P + \beta_2 H + \beta_3 K + \beta_4 EC + \beta_5 A + e$ , where the dependent variable is CB (Consumer buying behavior). The independent variables are P (Price), H (Health), K (Knowledge), EC (Environment concern), and A (Availability).

| Model | Intercept          | Regression coefficients of |                     |                     |                    |                     | Adj.<br>R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|---------------------|---------------------|--------------------|---------------------|---------------------------------------|-------|---------|
|       |                    | P                          | H                   | K                   | EC                 | A                   |                                       |       |         |
| 1     | 1.198<br>(5.084)** | 0.650<br>(11.411)**        |                     |                     |                    |                     | 0.466                                 | 0.627 | 130.221 |
| 2     | 1.027<br>(4.919)** |                            | 0.734<br>(13.741)** |                     |                    |                     | 0.559                                 | 0.570 | 188.802 |
| 3     | 1.198<br>(5.084)** |                            |                     | 0.786<br>(13.469)** |                    |                     | 0.549                                 | 0.576 | 181.409 |
| 4     | 2.219<br>(8.523)** |                            |                     |                     | 0.509<br>(6.347)** |                     | 0.210                                 | 0.763 | 40.285  |
| 5     | 1.589<br>(7.128)** |                            |                     |                     |                    | 0.639<br>(10.329)** | 0.417                                 | 0.656 | 106.697 |
| 6     | 0.763<br>(3.509)** | 0.256<br>(3.290)**         | 0.532<br>(6.631)**  |                     |                    |                     | 0.587                                 | 0.552 | 106.126 |
| 7     | 0.458<br>(2.228)*  | 0.131<br>(1.765)           | 0.363<br>(4.581)**  | 0.413<br>(5.533)**  |                    |                     | 0.657                                 | 0.503 | 95.314  |
| 8     | 0.477<br>(2.205)*  | 0.132<br>(1.767)           | 0.367<br>(4.555)**  | 0.420<br>(5.331)**  | 0.019<br>(0.283)   |                     | 0.654                                 | 0.505 | 71.043  |
| 9     | 0.322<br>(1.513)   | 0.110<br>(1.521)           | 0.363<br>(4.679)**  | 0.286<br>(3.353)**  | 0.031<br>(0.484)   | 0.219<br>(3.471)**  | 0.679                                 | 0.486 | 63.604  |

**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.

The regression result shows that the beta coefficients for price are positive with consumer buying behavior. It indicates that price has a positive impact on consumer buying behavior. This finding is similar to the findings of Al-Salamin and Al-Hassan (2016). The beta coefficients for health are positive with consumer buying behavior. It indicates that health has a positive impact on consumer buying behavior. This finding is consistent with the findings of Parashar et al. (2019). Similarly, the beta coefficients for knowledge are positive with consumer buying behavior. It indicates that promotion has a positive impact on consumer buying behavior. This finding is similar to the findings of Gracia and de Magistris (2007). The beta coefficients for environment concern are positive with consumer buying behavior. It indicates that environment concern has a positive impact on consumer buying behavior. This finding is similar to the findings of Laroche et al. (2001). Furthermore, the beta coefficients for availability are positive with consumer buying behavior. It indicates that availability of the organic vegetables has a positive impact on consumer buying behavior. This finding is consistent with the findings of Hossain and Lim (2016).

## 4. Summary and conclusion

In any marketing chain the consumer is the most important person. Consumer satisfaction is the ultimate objective of the marketing process. Farmers and those involved in marketing must be aware of consumer needs in order to produce and supply products that fulfill consumers' requirements. In the process of developing the vegetable sector in Nepal, it is essential to consider the needs, preferences and behaviour of consumers.

This study attempts to examine the consumer buying behavior of vegetables products in Kathmandu Valley. The study is based on primary data with 150 observations.

The study showed that price, health, knowledge, environment concern and availability have positive impact on consumer buying behavior of vegetable products in Kathmandu Valley. The study concluded that higher level of environment concern and easily availability of the vegetables stimulates the consumer buying behavior. The study also concluded that health followed by knowledge and availability is the most influencing factor that explains the changes in buying behavior of the consumers towards vegetable products in Kathmandu Valley.

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PART 6

# Human Resource Management





## Abstract

*This study examines the relationship between internet banking and customer retention in Nepalese commercial banks. Customer retention is the dependent variable. The selected independent variables are assurance, responsiveness, reliability, ease of use and security and privacy. The primary source of data is used to assess the opinions of the respondents regarding internet banking and customer retention in Nepalese commercial banks. The study is based on primary of 20 commercial banks with 150 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of internet banking on customer retention in Nepalese commercial banks.*

*The study showed ease of use has a positive impact on consumer retention. This indicates that increase in the ease of use of internet banking, higher would be the consumer retention. In addition, responsiveness has a positive impact on consumer retention. It reveals that increase in level of responsiveness leads to an increase in customer retention. Furthermore, reliability has a positive impact on consumer retention. It implies that increase in reliability leads to an increase in customer retention. Furthermore, assurance has a positive impact on consumer retention. It indicates that higher the assurance, higher would be the consumer retention. Likewise, security and privacy have a positive impact on consumer retention. It indicates that increase in privacy and security in internet banking leads to increase in consumer retention in Nepalese commercial banks.*

**Keywords:** Assurance, ease of use, responsiveness, reliability, security and privacy and customer retention.

# 1. Introduction

Information technology has become a fundamental element in improving the quality of services in general and e-banking services in particular. Due to rapid improvement in information and technology and through competition between banks, the distribution of financial services through electronic systems has spread among customers. According to Markku (2012), electronic banking services are the wave of future banking by providing enormous benefits to consumers in terms of ease and cost of transactions through online banking. Likewise, Yaghubi and Seyedin (2015) stated that electronic banking services are operationalized as banking services driven by information technology that enable customers to acquire a service without direct employee involvement. Furthermore, Sohail and Shanmugham (2003) showed that accessibility, reluctance, costs, trust, security, convenience, and ease of use are the most significant dimensions of e-banking. In addition, Liao and Cheung (2002) stated that user experience, user friendliness, user involvement, security, and speed are the significant dimensions of e-banking. E-banking can propose swift, speedy and reliable services to customers, making them more satisfied than with the manual banking system (Nupur, 2010).

Premarathne and Gunathilake (2016) defined internet banking as a set of technological tools offered by financial institutions for its customers to do banking transactions through computers using an internet connection. According to Bhattacharjee (2001), internet banking is an integrated system that offers customers flexible, suitable and low-cost platforms with integrated services of online personal banking such as online checking and saving accounts, certificate of deposit, money market accounts, investment services and other related financial services. Wu et al. (2014) stated that internet banking helps banks to adopt the system to earn more customer for the bank. Moreover, it helps customers' retention and providing best opportunity to achieve customer's goal.

Perera and Priyanath (2018) investigated the impact of internet banking service quality on customer satisfaction in Bank of Ceylon, Sri Lanka. The results revealed that contact, efficiency, system availability and compensation have significant positive impact on customer satisfaction. However, fulfillment, privacy and responsiveness did not have significant effect on the level of customer satisfaction. The results further revealed that the contact and efficiency are the most significant factors which improve the satisfaction level of the customers who are using internet banking. Similarly, Hamid et al. (2018) revealed that the banking services over the internet have a positive impact on customer satisfaction. In addition, Alawamleh et al. (2020) assessed the impact of online banking services quality dimensions on customer satisfaction at Jordanian banks. The service quality dimensions are reliability, guarantee, empathy, response and physical evidence. The result of the study showed that the customers of the bank were satisfied with the services offered.

E-service quality is about overall assessment and discernment by customer regarding the eminence and quality of e-service delivery (Santos, 2003). Akinyele and Olorunleke (2010) investigated the technology and service quality in banking industry in Nigeria. The study concluded that secured service is the most important dimension of e-banking. Rouibah (2015) showed that poor security, lack of trust, fear of failure, high charges and poor familiarity were the major constraints that affected e-payments. Besides, security features of internet, banking facilities, privacy and quality of services were also significant factors that determine the adoption of e-payments. In addition, Santouridis et al. (2009) investigated the internet banking in Greece by examining the customer satisfaction and the quality of internet banking services. The result of the study revealed that assurance, responsiveness and reliability have a significant and positive impact on the customer satisfaction level. The result also revealed that reliability has the strongest and

highest impact on customer satisfaction. Srivastava (2007) examined the customer's perception on usage of internet banking in India. The study found that education, gender and income play an important role in the usage of internet banking. Furthermore, Rabi (2011) emphasized the importance of application of internet banking as a viable tool to enhance and create customer satisfaction. The factors include convenience and speed, security and privacy, web design and content, and service quality. The result of the study revealed that all of the factors have positive impact on customer satisfaction of internet banking users. Likewise, Nupur (2010) revealed that reliability, empathy, responsiveness and assurance are positively related to customer satisfaction.

Khalif and Ali (2011) found that the adoption of e-banking (convenience, security, privacy, content, design, speed, fees and charge) has a positive effect on customer satisfaction, loyalty and word of mouth in Jordanian commercial banks. Jahangir and Begum (2008) showed a significant role of perceived usefulness, perceived ease of use, security and privacy on customer attitude to use electronic banking. Similarly, Kumbhar (2011) found a positive and significant impact of security on customer satisfaction. Likewise, Bebli (2011) revealed that there is a positive and significant relationship between secure transactions and customer satisfaction on internet banking. Auta (2010) revealed that security, user friendly, queue management, accessibility, time factor and fund transfer are major factors. The study also stated that out of total respondents, majority of respondents agreed that e-banking is convenient and flexible way of banking and it also has various transaction related benefits. Jun and Cai (2001) found that customers' perception of services quality and their satisfaction are influenced by their services encounters as well as internet banking service quality. Similarly, Philipos (2013) revealed that there is a positive and significant relationship of responsiveness and privacy with customer satisfaction.

In the context of Nepal, Pathak (2022) examines the impact of internet banking service quality on customer satisfaction in the context of Nepalese commercial banks. The results showed that speed of delivery has a positive impact on customer satisfaction. It indicates that increase in speed of delivery leads to increase in the level of customer satisfaction. In addition, ease of use has a positive impact on customer satisfaction. It implies that increase in the easiness of use of internet banking leads to increase in customer satisfaction. Likewise, reliability has a positive impact on customer satisfaction. It indicates that increase in reliability leads to increase in customer satisfaction. Moreover, there is a positive impact of privacy and security on customer satisfaction. It implies that higher privacy and security leads to increase in customer satisfaction. Pradhan (2019) concluded that the customer using e-banking services are satisfied in terms of the e-banking products, perceived ease of use, website design, security and privacy, perceived cost, responsiveness and computer self-efficacy. Likewise, Khatri and Dhungel (2013) showed that bank fails to provide the proper information about use, benefit and facilities under internet banking. Security policies, less familiarity towards technology and its application etc. are some of the major influencing factor regarding the less attraction of customers in internet banking. Gaire (2018) revealed a positive relationship between different dimension such as convenience, access, privacy, security, speed and fee and charges of internet banking and client satisfaction. Gyawali and Kunwar (2014) examined users' perceptions about internet banking service quality and their satisfaction taking attention over five service dimensions i.e. responsiveness, tangibility, empathy, assurance and reliability using SERVPERF model in Nepalese commercial banking industry. The study found positive and significant relationship between users' satisfaction and five service quality dimensions.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the internet banking and consumer 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 main purpose of the study is to analyze the relationship between internet banking and customer retention in Nepalese commercial banks. Specifically, it examines the impact of assurance, responsiveness, reliability, ease of use and security and privacy of internet banking on customer retention in Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on the primary data. The data were gathered from 150 respondents through questionnaire. The respondents' views were collected on assurance, responsiveness, reliability, ease of use and security and privacy. The study is based on descriptive and causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the number of the respondents.

**Table 1:** List of commercial banks selected for the study along with number of respondents

| S.No                               | Name of the commercial banks          | Number of respondents |
|------------------------------------|---------------------------------------|-----------------------|
| 1                                  | Agricultural Development Bank Limited | 6                     |
| 2                                  | Civil Bank Limited                    | 9                     |
| 3                                  | Nabil Bank Limited                    | 8                     |
| 4                                  | Everest Bank Limited                  | 3                     |
| 5                                  | Nepal Investment Bank Limited         | 6                     |
| 6                                  | Global IME Bank Limited               | 9                     |
| 7                                  | Nepal Bank Limited                    | 7                     |
| 8                                  | Prabhu Bank Limited                   | 8                     |
| 9                                  | Himalayan Bank Limited                | 5                     |
| 10                                 | Mega Bank Nepal Limited               | 9                     |
| 11                                 | NIC Asia Bank Limited                 | 5                     |
| 12                                 | Citizens Bank International Limited   | 13                    |
| 13                                 | Siddhartha Bank Limited               | 8                     |
| 14                                 | Sanima Bank Limited                   | 6                     |
| 15                                 | Standard Chartered Bank Limited       | 5                     |
| 16                                 | NMB Bank Limited                      | 8                     |
| 17                                 | Machhapuchhre Bank Limited            | 9                     |
| 18                                 | Nepal Bangladesh Bank Limited         | 8                     |
| 19                                 | Rastriya Banijya Bank Limited         | 10                    |
| 20                                 | Bank of Kathmandu Limited             | 8                     |
| <b>Total number of respondents</b> |                                       | <b>150</b>            |

Thus, the study is based on 150 observations.

## The model

The model estimated in this study assumes that customer retention depends on assurance, responsiveness, reliability, ease of use, security and privacy. Therefore, the model takes the following form:

$$CR = \beta_0 + \beta_1 AS + \beta_2 EU + \beta_3 RS + \beta_4 RE + \beta_5 SP + \epsilon$$

Where,

CR = Consumer retention

AS = Assurance

EU = Ease of use

RS = Responsiveness

RE = Reliability

SP = Security and privacy

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 are 5 items and sample items include “I am satisfied with internet banking service provided by my bank”, “I would like to say the positive things about the service of my bank to others” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.845$ ).

Assurance was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I feel confident to transact through internet banking”, “Internet banking provides protection to my data” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.827$ ).

Responsiveness was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Internet banking service of my bank is clear and easy to use”, “Internet banking tells what to do if the transaction is not proceed” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.804$ ).

Reliability was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Internet banking delivers service as promised”, “Internet banking provides sufficient and accurate information” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.858$ ).

Security and privacy 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 “My bank provides privacy of account details well maintained and is duly supported by privacy policies”, “The confidentiality of my data is ensured” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.850$ ).

Ease of use was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Internet banking is easy to use”, “Internet banking is easy to use” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.869$ ).

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

## Assurance

Assurance refers to the ability the internet banking conveys trust and confidence to their consumers. According to Kordnaeij et al. (2013), there is a positive significant relationship of assurance, security, web design and speed with customer retention. Likewise, Joshi (2015) found a positive and significant impact of assurance on the level of customer satisfaction. Similarly, Tisman and Ahmad (2016) assessed the factors affecting customer loyalty in banking sectors of Punjab, Pakistan. The study found that assurance and trust significantly influence customer satisfaction and loyalty. Moreover, Mohammad and Alhamadani (2011) stated that five service quality dimensions (empathy, tangibles, reliability, responsiveness and assurance) have significant positive influence on customer satisfaction in commercial banks in Jordan. In addition, Fah and Kandasamy (2011) noted that tangibility, reliability, assurance, responsiveness and empathy have significant relationship with customer satisfaction in Malaysian hotels. The study also found that assurance positively affect the consumer retention towards the use of internet banking. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship between assurance and consumer retention.

## Ease of use

Sharma and Malviya (2014) explored the internet banking service quality and its impact on customer satisfaction in Indore district of Madhya Pradesh. The study found that there is a positive impact of service quality dimensions on customer satisfaction. The study also concluded that website ease of use, comfort and accessibility are the influential factors that have significant impact on the satisfaction of the online customers. Likewise, Jahangir and Begum (2008) found that there is a significant positive impact of ease of use on customer perception. Moreover, Zavareh et al. (2012) showed that e-service quality dimensions have significant positive effects on e-customer satisfaction. Similarly, Alsamydai et al. (2012) concluded that e-banking quality, ease of use, security and awareness have positive impact on customer satisfaction. Furthermore, Omar and Sentosa (2013) revealed that reliability, ease of use, speed, safety, and security have positive impact on customer satisfaction. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship between ease of use and consumer retention.

## Responsiveness

Cooil et al. (2006) suggested that an increase in responsiveness through internet banking can increase the level of customer satisfaction. Similarly, Philipos (2013) analyzed the customer satisfaction and electronic banking service on some selected banks in Ethiopia. The study revealed that there is a positive and significant relationship of responsiveness and privacy with customer satisfaction. Khanal (2015) examined the impact of service quality dimensions on customer satisfaction and customer loyalty in Nepalese commercial banks. The study revealed that there is a positive and significant relationship of tangibility, reliability, responsiveness, assurance and empathy with customer satisfaction and customer loyalty in the Nepalese commercial banks. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship between responsiveness and consumer retention.

## Reliability

Islam and Salma (2014) revealed that reliability of ATM service is the key to customer satisfaction and has a positive relationship with customer satisfaction. Nochai and Nochai (2013) analyzed the impact of internet banking service on customer satisfaction in Thailand. The study found a positive and significant relationship between internet banking adoption and its seven factors, namely reliability, ease of use, transaction efficiency, customer support, quality, performance, and service content. Similarly, Omar et al. (2011) analyzed the customer perception towards online banking services in Pakistan. The study found that customers prefer internet banking (IB) services over branch banking due to reliability, convenience, speed, safety and security, cost effectiveness, user-friendly and error free system. Furthermore, Gupta (2008) observed a positive impact of reliability on customer satisfaction. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship between reliability and consumer retention.

## Security and privacy

Khalif and Ali (2011) found that the adoption of e-banking (convenience, security, privacy, content, design, speed, fees and charge) has positive effect on customer satisfaction, loyalty and word of mouth in Jordanian commercial banks. Similarly, Joshi (2015) found a positive and significant relationship between service quality factors such as privacy, security, responsiveness and efficiency and customer satisfaction. Likewise, Kumbhar (2011) found a positive and significant impact of security on customer satisfaction. Moreover, Bebli (2011) revealed that there is a positive and significant relationship between secure transactions and customer satisfaction on internet banking. Similarly, Arokiasamy and Abdullah (2013) revealed that there is a positive relationship between internet banking services (security, convenience, web design and speed of delivery) and customer satisfaction. The study also found that security positively affect the consumer retention towards the use of internet banking. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of security and privacy with consumer retention.

## 3. Results and discussion

### Correlation analysis

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



**Table 2:** Kendall's correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent and independent variables. The correlation coefficients are based on 150 observations. The dependent variable is CR (Consumer retention). The independent variables are AS (Assurance), EU (Ease of use), RS (Responsiveness), RE (Reliability) and SP (Security and privacy).

| Variables | Mean  | SD    | CR      | AS      | EU      | RS      | RE      | SP |
|-----------|-------|-------|---------|---------|---------|---------|---------|----|
| CR        | 3.370 | 0.943 | 1       |         |         |         |         |    |
| AS        | 3.434 | 0.927 | 0.625** | 1       |         |         |         |    |
| EU        | 3.320 | 0.910 | 0.631** | 0.656** | 1       |         |         |    |
| RS        | 3.467 | 0.908 | 0.595** | 0.601** | 0.629** | 1       |         |    |
| RE        | 3.491 | 0.930 | 0.553** | 0.589** | 0.519** | 0.587** | 1       |    |
| SP        | 3.387 | 0.946 | 0.639** | 0.565** | 0.555** | 0.573** | 0.613** | 1  |

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

The study reveals that assurance is positively related to consumer retention. It indicates that higher the assurance, higher would be the consumer retention. Similarly, ease of use has a positive relationship with consumer retention. This indicates that increase in the ease of use of internet banking, higher would be the consumer retention. In addition, responsiveness has a positive relationship with consumer retention. It reveals that increase in level of responsiveness leads to an increase in customer retention. Furthermore, reliability is positively related to consumer retention. It implies that increase in reliability leads to an increase in customer retention. Likewise, security and privacy have a positive relationship with consumer retention. It indicates that increase in privacy and security in internet banking leads to increase in consumer retention in Nepalese commercial banks.

## Regression analysis

Having analyzed the Kendall's Tau correlation coefficients matrix, the regression analysis has been carried out and the results are presented in Table 3. More specifically, it presents the regression results of assurance, ease of use, responsiveness, reliability and security and privacy on consumer retention in Nepalese commercial banks.

**Table 3:** Estimated regression results of assurance, ease of use, responsiveness, reliability and security and privacy on consumer retention  
The results are based on 150 observations using linear regression model. The model is  $CR = \beta_0 + \beta_1 AS + \beta_2 EU + \beta_3 RS + \beta_4 RE + \beta_5 SP + e$ , where the dependent variable is CR (Consumer retention). The independent variables are AS (Assurance), ES (Ease of use), RS (Responsiveness), RE (Reliability), and PS (Security and privacy).

| Model | Intercept          | Regression coefficients of |                     |                     |                     |                     | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|---------------------|---------------------|---------------------|---------------------|-------------------------|-------|---------|
|       |                    | AS                         | EU                  | RS                  | RE                  | SP                  |                         |       |         |
| 1     | 0.685<br>(3.953)** | 0.701<br>(16.175)**        |                     |                     |                     |                     | 0.636                   | 0.575 | 261.634 |
| 2     | 0.746<br>(3.802)** |                            | 0.569<br>(13.946)** |                     |                     |                     | 0.565                   | 0.629 | 194.491 |
| 3     | 0.800<br>(4.114)** |                            |                     | 0.579<br>(13.791)** |                     |                     | 0.559                   | 0.629 | 190.198 |
| 4     | 0.201<br>(3.283)** |                            |                     |                     | 0.656<br>(14.018)** |                     | 0.568                   | 0.621 | 196.512 |
| 5     | 0.533<br>(2.971)** |                            |                     |                     |                     | 0.717<br>(16.456)** | 0.644                   | 0.564 | 270.787 |
| 6     | 0.442<br>(2.498)*  | 0.549<br>(6.869)**         | 0.319<br>(3.918)**  |                     |                     |                     | 0.668                   | 0.547 | 151.176 |
| 7     | 0.411<br>(2.312)*  | 0.496<br>(5.567)**         | 0.243<br>(2.449)*   | 0.141<br>(1.318)    |                     |                     | 0.670                   | 0.544 | 101.867 |
| 8     | 0.323<br>(1.792)   | 0.444<br>(4.863)**         | 0.174<br>(1.689)    | 0.068<br>(0.620)    | 0.214<br>(2.185)*   |                     | 0.678                   | 0.535 | 79.570  |
| 9     | 0.136<br>(0.821)   | 0.389<br>(4.679)**         | 0.017<br>(0.177)    | 0.111<br>(1.106)    | 0.016<br>(0.168)    | 0.452<br>(5.766)**  | 0.737                   | 0.482 | 84.466  |

**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 retention is the dependent variable.

The regression results show that the beta coefficients for assurance are positive with consumer retention. It indicates that assurance has a positive impact on consumer retention. This finding is consistent with the findings of Kordnaei et al. (2013). Similarly, the beta coefficients for ease of use are positive with consumer retention. It shows that ease of use has a positive impact on consumer retention. This finding is similar to the findings of Alsamydai et al. (2012). Further, the beta coefficients for responsiveness are positive with consumer retention. It indicates that responsiveness has a positive impact on consumer retention. This finding is consistent with the findings of Philipos (2013). In addition, the beta coefficients for reliability are positive with consumer retention. It indicates that reliability has a positive impact on consumer retention. This finding is similar to the findings of Gupta (2008). Similarly, the beta coefficients for security and privacy are positive with consumer retention. It shows that security and privacy have a positive impact on consumer retention. This finding is similar to the findings of Arokiasamy and Abdullah (2013).

## 4. Summary and conclusion

In a competitive and dynamic business environment, corporations have to deliver excellent customer experience and build a portfolio of loyal customers who can guarantee repeat purchase for the continuity of the business. Hence, banks have to invest heavily in strategies that enhance customer retention such as use of e-banking. It is expected that electronic banking will improve service quality in banks and further increase retention.

This study attempts to examine the relationship between internet banking and customer retention in Nepalese commercial banks. The study is based on primary data with 150 observations.

The study showed that assurance, ease of use, responsiveness, reliability and security and privacy have positive impact on customer retention in Nepalese commercial banks. The study concluded that better internet banking service quality leads to higher level of satisfaction towards the organization and hence increases customer retention. The study also concluded that security and privacy followed by assurance and reliability are the most influencing factors that explain the changes in customer retention in Nepalese commercial banks.

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## Abstract

*This study examines the impact of working environment on employee job satisfaction in Nepalese commercial banks. Job satisfaction is the dependent variable. The selected independent variables are physical environment, psychological environment working hours, supervisor support, safety at work and job stress. The primary source of data is used to assess the opinions of the respondents regarding working environment and level of job satisfaction in Nepalese commercial banks. The study is based on primary data with 115 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 working environment on employee job satisfaction in Nepalese commercial banks.*

*The study showed that physical environment has a positive impact on employee job satisfaction. It implies that better physical environment leads to increase in employee job satisfaction. The result also revealed that psychological environment has a positive impact on employee job satisfaction. It implies that better the psychological environment in the organization, higher would be the job satisfaction. Moreover, working hours have a positive impact on job satisfaction indicating that flexible working hours leads to increase in employee job satisfaction. Furthermore, supervisor support has a positive impact on employee job satisfaction indicating that greater the level of supervisor's support, higher would be the employee job satisfaction. Similarly, the result also showed that safety at work has a positive impact on employee job satisfaction. It implies that more safety at work leads to increase in employee job satisfaction. In addition, the result also showed that job stress has a negative impact on employee job satisfaction. It implies that increase in job stress leads to decrease in employee job satisfaction.*

**Keywords:** Job satisfaction, physical environment, psychological environment, supervisor support, safety at work and job stress.

# 1. Introduction

In the modern era, organizations are facing several challenges due to the dynamic nature of the environment. One of the many challenges for a business is to satisfy its employees in order to cope up with the ever changing and evolving environment and to achieve success and remain competitive. In order to increase efficiency, effectiveness, productivity and job commitment of employees, the business must satisfy the needs of its employees by providing good working environment (Markos and Sridevi, 2010). A working environment is the environment where people work together for achieving organization objectives. The work environment involves the physical geographical location as well as the immediate surroundings of the workplace such as a construction site or office building. It typically involves other factors relating to the place of employment such as the quality of the air, noise level and additional perks and benefits of employment such as free child care or unlimited coffee, or adequate parking (Awan and Tahir, 2015). Agbozo et al. (2017) stated that an attractive and supportive work environment is critical to job satisfaction. Work environment have numerous properties that may influence both physical and mental wellbeing. A quality work spot is fundamental to keep workers on their various task and work effectively. A good workplace with competitive wages, trusting relationship between the employees and management, equity and fairness for everyone, and a sensible work load with challenging yet achievable goals make the work station the best possible working conditions for employees to work with high level of satisfaction. According to Sarode and Shrisath (2012), the physical aspects of a workplace environment can have a direct impact on the productivity, health and safety, comfort, concentration, job satisfaction and morale of the people within it. Important factors in the work environment that should be considered include building design and age, workplace layout, workstation set-up, furniture and equipment design and quality, space, temperature, ventilation, lighting, noise, vibration, radiation, air quality. The office environment in which employees work and undertake most of their activities can impact on their productivity. The quality and quantity of work generated by employees are influenced by the office environment. Poor environmental conditions can cause inefficient worker productivity as well as reduce their job satisfaction, which in turn will impact on the financial well-being of the organization (Mathews and Khann, 2016).

Job satisfaction for an employee is the level of satisfaction according to job and is a crucial indicator of how employees feel about their job and describes how much they are contented with their job (Malik et al., 2010). In current era of highly volatile business environment, organizations are facing emerging challenges in form of acquisition and optimization of human resource. Human resources are considered as a source of sustainable competitive advantage. The success of an organization depends upon several factors but the most crucial factor that affects the organization performance is its employee (Petrescu and Simmons, 2008). In any organization, HRM practices focus on optimal utilization and management of their human resource effectively in order to achieve maximum output. Managing people is concerned with deciding approaches and strategies to find alternatives of how to achieve organization goals (Gurbuz, 2009). Salunke (2015) defined work environment as the physical aspect of a workplace that is influential towards job satisfaction, health, concentration and productivity as well. Therefore, maintaining a good work environment is the most practical way to reduce sick leaves, minimizing turnover rates, enhance individual efficiency and employee' performance.

Sundstrom et al. (1994) stated that better physical environment of office will boost the employees and ultimately improve their productivity. Most people spend fifty percent of their lives within indoor environments, which greatly influence their mental status, actions, abilities and performance. According to Boles et al. (2004), when there is a proper office environment, it helps in reducing the number of absenteeism



and thus can increase the employees' productivity which will lead to the increasing performance of the organization. In addition, Mokaya et al. (2013) stated that employees value work conditions as essential ingredients to their satisfaction. Moreover, Roelofsen (2002) indicated that improving the working environment reduces complaints and absenteeism and increases productivity. Asriani and Riyanto (2020) stated that a good working environment will contribute to high employee retention and in turn, will have a positive impact on the performance of the organization. On the other hand, a good working environment can affect the feelings and emotions of employees. If employees like the environment where they work, then they will feel comfortable and tend to be comfortable in doing work activities and work effectively and efficiently. Budianto and Katini (2015) revealed that unfavorable work environments can demand more labor and time and do not support the acquisition of efficient work system plans.

Zeb et al. (2014) analyzed factors influencing job satisfaction of employees in telecom sector of Pakistan. The study found that the key factors that contribute to employee job satisfaction are promotion, pay, fairness and working condition. Money and compensation play an important role in determining the job satisfaction of the telecom employees of Pakistan. Armstrong (2006) found that job satisfaction has multi-dimensional facets consisting of attitudes towards salary, promotion, working experience, working environment and nature of work. Schroffel (1999) revealed that better working environment and salary leads to higher level of job satisfaction. Chandrasekar (2011) concluded that an organization needs to pay attention to create a work environment that enhances the ability of employees to become more productive in order to increase profits for organization. Moreover, Taheri et al. (2020) assessed the impact of working environment on job satisfaction. The study revealed that there is positive relationship between work environment and job satisfaction. Aziz et al. (2015) revealed that work environment is a major contributing factor towards job satisfaction among the health workers. Similarly, Shrivasti and Bhola (2015) reported that there is positive correlation between working environment of the organizations and job satisfaction. Furthermore, Agbozo et al. (2017) indicated that most of the staff at the bank are satisfied with their work environment especially the physical ambience.

In context of Nepal, Hakuduwal (2021) analyzed the factors affecting employee job satisfaction in hotels of Bhaktapur, Nepal. The study found that compensation and reward, working environment, career development, and job security have significant impact on employee job satisfaction. However, the relationship with co-workers has a significant negative impact on employee job satisfaction in the hotels of Bhaktapur. Thapa et al. (2017) found work life balance, incentives and reward, work environment, employer branding, career growth and organization culture have significant relationship with employee performance. Moreover, Thagunna (2020) examined the factors impacting employees' performance in Nepalese commercial banks. The study showed that organizational culture, physical work environment, work-life balance, supervisor support and workplace incentives have positive impact on employees' performance in Nepalese commercial banks.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of working environment on employee job satisfaction. 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 impact of working environment on employee job satisfaction in Nepalese commercial banks. More specifically, it examines the impact of physical environment, psychological environment, working hours, supervisor's support, and safety at work and job stress on employee job satisfaction 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 were gathered from 115 respondents through questionnaire. The respondents' views were collected on physical environment, psychological environment, working hours, supervisor support, and safety at work and job stress. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that job satisfaction depends on physical environment, psychological environment, working hours, supervisor's support, and safety at work and job stress. Therefore, the model takes the following form:

$$JS = \alpha + \beta_1 PE + \beta_2 PSE + \beta_3 WH + \beta_4 SS + \beta_5 ST + \beta_6 S + e$$

Where,

JS = Job satisfaction

PE = Physical environment

PSE = Psychological environment

WH = Working hours

SS = Supervisor support

ST = Safety at work

S = Job stress

Physical environment 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 furniture I use is comfortable, flexible to adjust, easy to rearrange or reorganize", "The office is free of unnecessary noises" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.766$ ).

Psychological environment 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 frequently meet with my supervisor and talk about my personal development", "My work recognized and appreciated by the management" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.780$ ).

Working hours 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 satisfied with the working hours and it fits with my private life", "My working hours let me to work at my personal issues too" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.856$ ).

Supervisor support 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 “My supervisor routinely communicates with me and encourage me to do well”, “My supervisor helps me get the resources I need” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.863$ ).

Safety at work 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 my safety is a priority at my company”, “I am aware about my building’s emergency evacuation plan” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.815$ ).

Job stress 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 have an appropriate amount of work assigned to me”, “I have unachievable deadlines” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.882$ ).

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 “If my friends/ relatives are interested to work in my organization, I would strongly recommend it.”, “I am very satisfied with my current job” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.842$ ).

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

## Physical environment

Nawaz et al. (2022) investigated the effect of the physical work environment on the job satisfaction level of the nurses working in rural health settings. The results found that the physical environment at the workplace is the strongest predictor of the job satisfaction level among nurses. Newsham et al. (2009) found that physical work environment has a positive relationship with employee job satisfactions. Stallworth and Kleiner (1996) argued that increasingly an organization’s physical layout is designed around employee needs in order to maximize productivity and satisfaction. Kohun (2002) stated that office layout and design impressions serve as a symbolic function and has a positive effect on employee productivity. Chandrasekhar (2011) stated that better physical workplace environment will boost employees’ job satisfaction and ultimately improve their productivity. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: Physical environment has a positive relationship with job satisfaction.

## Psychological environment

Sell and Cleal (2011) assessed the reaction of employees in hazardous work environment with high monetary benefits, non-hazardous work environment and low monetary benefits. The study showed that different psychosocial and work environment variables like work place, social support have direct impact on job satisfaction. Likewise, Haynes (2008) found that the behavior components of working environment have positive impact on job satisfaction. Similarly, Rothner (2005) showed that self-efficacy, positive effect, sense of coherence and job satisfaction correlated positively with one another. Moreover, Srivastava (2008) indicated that psycho-social environment in work-place exert more impact on employees’ job behavior

and organizational effectiveness than the physical environment. The Based on it, this study develops the following hypothesis:

H<sub>2</sub>: Psychological environment has a positive relationship with job satisfaction.

## **Working hours**

Scandura and Lankau (1997) showed that flexible working hour is related to higher organizational commitment and job satisfaction. The study showed that long working hours has a negative effect on level of productivity. Similarly, Sarah and Alwine (2012) found that flexible work hour and overtime have positive impact on life and job satisfaction. If an employee needs to work overtime, the employer will need to pay overtime payments to employees as required in the law. Wooden et al. (2009) found that if employees' overtime is appropriately compensated, satisfaction rises, and the working hour mismatch decreases. Furthermore, Nakata (2017) examined long working hours, job satisfaction, and depressive symptoms among Japanese employees. The study found that there is a negative relationship between long working hour and job satisfaction. It also stated that long working hours leads to depression. Based on it, the study develops the following hypothesis:

H<sub>3</sub>: Working hours has a negative relationship with job satisfaction.

## **Supervisor support**

Gagnon and Michael (2004) assessed outcomes of perceived supervisor support for wood production employees. The study concluded that employees who perceive themselves to be in a supportive relationship with their supervisor tend to have higher performance, job satisfaction and organizational commitment. Further, Hall (2007) found that nurses with greater levels of perceived supervisor support experienced more positive job outcomes and less negative outcomes, including less occupational stress. Likewise, Talukder and Galang (2021) concluded that there is a significant positive relationship between supervisor support and employee satisfaction. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship of supervisor support on job satisfaction.

## **Safety at work**

Wolniak and Olkiewicz (2019) stated that perceived security and safety affects the employee's satisfaction. When an employee feels safe in the company, he/she will perform better. Similarly, Gyekye (2005) examined the relationship of job satisfaction with safety management policies. The result showed that there is significant positive relationship between job satisfaction and safety at work. Moreover, Putri et al. (2018) examined the effect of occupational health and safety, work environment and discipline on employee performance in consumer goods company. The study concluded that occupational health and safety have significant positive impact on employee job satisfaction. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of safety at work on job satisfaction.

## Job stress

Hoboubi et al. (2017) assessed the impact of job stress and job satisfaction on workforce productivity in an Iranian petrochemical industry. The study found that there is a negative relationship between job stress and job satisfaction and employees' productivity. Riaz et al. (2016) showed that job stress is negatively related to employee job satisfaction. Kotteeswari and Sharief (2014) found that there is a negative relationship between job stress and job satisfaction. It means that higher the stress, lower would be the job satisfaction and hence, lower productivity. Ahsan et al. (2009) analyzed the job stress on job satisfaction among university staff in Malaysia. The study showed that there is a negative relation between job stress and job satisfaction. Based on it, the study develops the following hypothesis:

$H_6$ : Job stress has a negative relationship with 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 correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 115 observations. The dependent variable is JS (Job satisfaction). The independent variables are PE (Physical environment), PSE (Psychological environment), WH (Working hours), SS (Supervisor support) And ST (Safety at work) and S (Job stress).

| Variables | Mean  | SD    | PE      | PSE     | WH      | SS      | ST      | S        | JS |
|-----------|-------|-------|---------|---------|---------|---------|---------|----------|----|
| PE        | 2.240 | 0.620 | 1       |         |         |         |         |          |    |
| PSE       | 2.302 | 0.621 | 0.478** | 1       |         |         |         |          |    |
| WH        | 2.847 | 0.900 | 0.399** | 0.485** | 1       |         |         |          |    |
| SS        | 2.227 | 0.686 | 0.437** | 0.604** | 0.438** | 1       |         |          |    |
| ST        | 2.283 | 0.670 | 0.338** | 0.482** | 0.448** | 0.487** | 1       |          |    |
| S         | 2.660 | 0.545 | 0.227** | 0.414** | 0.371** | 0.351** | 0.373** | 1        |    |
| JS        | 2.840 | 0.851 | 0.399   | 0.485** | 0.417** | 0.438** | 0.448** | -0.371** | 1  |

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

Table 1 shows that there is a positive relationship between physical environment and employee job satisfaction. It implies that better physical environment leads to increase in employee job satisfaction. The result also reveals that psychological environment is positively correlated to employee job satisfaction. It implies that better the psychological environment in the organization, higher would be the job satisfaction. Moreover, working hours is positively correlated to job satisfaction indicating that flexible working hours leads to increase in employee job satisfaction. Furthermore, supervisor support is positively correlated to employee job satisfaction indicating that greater the level of supervisor's support, higher would be the employee job satisfaction. Similarly, the result also shows that safety at work is positively correlated to em-

mployee job satisfaction. It implies that more safety at work leads to increase in employee job satisfaction. In addition, the result also shows that job stress is negatively correlated to employee job satisfaction. It implies that increase in job stress leads to decrease in employee job satisfaction.

## 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 physical environment, psychological environment, supervisor's support, working hours, safety at work and job stress on employee job satisfaction in Nepalese commercial banks.

**Table 2:** Estimated regression results of physical environment, psychological environment, working hours, supervisor's support, Job stress and safety at work on employee job satisfaction

The results are based on 115 observations using linear regression model. The model is  $JS = \alpha + \beta_1 PE + \beta_2 PSE + \beta_3 WH + \beta_4 SS + \beta_5 ST + \beta_6 S + e$ , where the dependent variable is JS (Job satisfaction). The independent variables are PE (Physical environment), PSE (Psychological environment), WH (Working hours), SS (Supervisor support) And ST (Safety at work) and S (Job stress).

| Model | Inter-cept          | Regression coefficients of |                    |                    |                    |                    |                     | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|--------------------|--------------------|--------------------|--------------------|---------------------|-------------------------|-------|---------|
|       |                     | PE                         | PSE                | WH                 | SS                 | ST                 | S                   |                         |       |         |
| 1     | 1.124<br>(4.147)**  | 0.768<br>(6.564)**         |                    |                    |                    |                    |                     | 0.271                   | 0.769 | 43.091  |
| 2     | 0.710<br>(2.829)**  |                            | 0.924<br>(8.736)** |                    |                    |                    |                     | 0.403                   | 0.697 | 77.188  |
| 3     | 2.336<br>(11.866)** |                            |                    | 0.369<br>(6.430)** |                    |                    |                     | 0.166                   | 0.535 | 41.390  |
| 4     | 1.227<br>(5.098)**  |                            |                    |                    | 0.727<br>(7.067)** |                    |                     | 0.302                   | 0.753 | 49.946  |
| 5     | 1.051<br>(4.301)**  |                            |                    |                    |                    | 0.784<br>(7.636)** |                     | 0.337                   | 0.734 | 58.311  |
| 6     | 0.912<br>(2.397)*   |                            |                    |                    |                    |                    | -0.726<br>(5.173)** | 0.186                   | 0.813 | 26.759  |
| 7     | 0.417<br>(1.549)*   | 0.334<br>(2.602)**         | 0.728<br>(5.715)** |                    |                    |                    |                     | 0.432                   | 0.679 | 43.966  |
| 8     | 0.767<br>(2.580)*   | 0.187<br>(2.264)*          | 0.395<br>(4.426)** | 0.214<br>(3.825)** |                    |                    |                     | 0.311                   | 0.486 | 31.61   |
| 9     | 0.661<br>(2.035)*   | 0.179<br>(2.148)*          | 0.401<br>(4.475)** | 0.205<br>(3.586)** | 0.043<br>(0.805)   |                    |                     | 0.31                    | 0.487 | 23.83   |
| 10    | 0.284<br>(0.84)     | 0.158<br>(1.930)           | 0.306<br>(3.307)** | 0.177<br>(3.147)** | 0.037<br>(0.702)   | 0.257<br>(3.244)** |                     | 0.342                   | 0.475 | 22.078  |
| 11    | 0.038<br>(1.016)    | 0.049<br>(0.844)           | 0.404<br>(4.309)** | 0.156<br>(2.921)** | 0.270<br>(4.157)** | 0.076<br>(1.949)   | -0.290<br>(3.080)** | 0.385                   | 0.169 | 11.780  |

### 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.
- Job satisfaction is the dependent variable.

The regression results show that the beta coefficients for physical environment are positive with employee job satisfaction. It indicates that physical environment has a positive impact on employee job satisfaction. This finding is similar to the findings of Kohun (2002). Likewise, the beta coefficients for psychological environment are positive with employee job satisfaction. It indicates that psychological environment has a positive impact on employee job satisfaction. This finding is consistent with the findings of Srivastava (2008). Moreover, the beta coefficients for supervisor support are positive with employee job satisfaction. It indicates that supervisor support has positive impact on employee job satisfaction. This finding is similar to the findings of Talukder and Galang (2021). Furthermore, the beta coefficients for working hours are positive with employee job satisfaction. It indicates that flexible working hour has a positive impact on employee job satisfaction. This finding is consistent with the findings of Scandura and Lankau (1997). Similarly, the beta coefficients for safety at work are positive with employee job satisfaction. It indicates that safety at work have a positive impact on employee job satisfaction. This finding is similar to the findings of Wolniak and Olkiewicz (2019).

## 4. Summary and conclusion

Organization must always develop the career of its employees and create a good work environment so that the level of employee job satisfies action will increase. The satisfaction level of employees also associated with increase output of the organization and is essential to the success of an organization. In an organization, a high rate of employee contentedness is directly related to a lower turnover rate. Thus, keeping employee satisfaction in their jobs should be a foremost priority for every organization.

This study attempts to examine the impact of working environment on employee job satisfaction in Nepalese commercial banks. The study is based on primary data with 115 observations.

The study showed that physical environment, psychological environment, working hours, supervisor support and safety at work have positive impact on employee job satisfaction. However, job stress has a negative impact on employee job satisfaction in the context of Nepalese commercial banks. The study concluded that better working environment leads to higher level of employee job satisfaction. The study also concluded that psychological environment is the most influencing factor that explains the change in employee job satisfaction in the context of Nepalese commercial banks.

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## Abstract

*This study examines the impact of work ethics on organizational productivity in the context of Nepalese commercial banks. Organizational productivity is the dependent variable. The selected independent variables are corruption, self-discipline, communication, morality, integrity and co-ordination. The primary source of data is used to assess the opinions of the respondents regarding work ethics in Nepalese commercial banks. The study is based on primary data of 24 commercial banks with 114 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 work ethics on organizational productivity in the context of Nepalese commercial banks.*

*The study showed that corruption has a negative impact on organizational productivity. It implies that increase in corruption practices in organization leads to decrease in bank productivity. The result also revealed that self-discipline has a positive impact on organizational productivity. It implies that self-disciplined employees lead to higher organizational productivity. Similarly, communication has a positive impact on organizational productivity. It indicates that better communication leads to higher level of organizational productivity. Likewise, the result also shows that morality has a positive impact on organizational productivity. It implies that high morality in employees leads to increase in organizational productivity. Furthermore, integrity has a positive impact on organizational productivity. It indicates that high integrity in employees leads to higher organizational productivity. Moreover, the result also showed that coordination has a positive impact on organizational productivity. It implies that better coordination between the employees leads to increase in organizational productivity.*

**Keywords:** Organizational productivity, corruption, self-discipline, communication, morality, integrity and co-ordination.

# 1. Introduction

Work ethics are the standards of behaviour that guide individual workers in their work and in relationship with fellow workers, customers and other economic agents (competitors, shareholders, suppliers, dealers, etc.). These ethics guide the thinking and decision making with respect to what is good and what is bad (Grace and Cohen 2005). Having a good work ethic leads a person to make physical, mental, and emotional efforts in his work to fulfill and even exceed expectations. Work ethic is a cultural norm that encourages people to take full responsibility for the work they do based on the belief that work has intrinsic value for individuals (Omisore and Adeleke, 2015). Work ethics is a foundation on which a person's attitude is built. Ethics is related to how a person must behave, while values are mental judgments that determine how a person actually behaves. The success of any organization depends on how its members carry out their duties. If members are effective, efficient and committed to their work, the organization will be able to achieve its mission (Runtu et al., 2019). The traditional work ethic stressed that work is inherently good and by working hard one can overcome obstacles and succeed in life (Yoder and Staudohar, 1982). It is conceived as people's orientation to and expectation from work as informed by their convictions. Fajana (2006) opined that it consists of those principles and practices that are concerned with morals and good conducts in industrial life.

Ethical behavior and the prevailing system of employment relations in any work organizations is very crucial for the development of the organization. In other words, how well organizations adhere to ethical standards, obviously, determines the well-being of all the stakeholders, the organization's productivity and the subsequent profitability. The desperation of the productive enterprise to achieve corporate goals and workers' desire for equity have naturally affected etiquette, integrity, self-discipline and by extension the level of performance and productivity within the framework of employment relationship (Abiodun et al., 2014). The goal of any organization is to have employees behave in a manner consistent with the company's mission and goals i.e., aligning absolutely with the core values, adhering to a code of ethics and matching actions with beliefs across a variety of situations (Pattison and Edgar, 2011). Meanwhile, integrity play a fundamental role in employee pattern of alignment, sound moral, ethical principles and organization productivity. Moreover, absenteeism, unwarranted breaks, stealing of organization property, converting office equipment for personal use, gossiping etc. are characteristics of unethical conducts and are liable to affect organization productivity (Muafi, 2011). However, the organization level of productivity is directly proportional to employee level of commitment and satisfaction. Thus, the commitment and satisfaction become immaterial if it does not infuse with integrity (Arnold, 2009). Integrating values of integrity into the day-to-day operation of an organization will promote employee's ethical behavior, prevent damaging lapses while tapping into human instincts for moral thought/action and as well enhanced sustained productivity (Bergman, 2006).

Self-discipline at the workplace is an optimistic determination and efforts which assists in developing certain traditions for guiding individual's feelings, conducts, behaviors, thoughts, activities and habits. Self-discipline is an art of self-control, self-reliance, self-determination and self-sufficiency, which stimulates an individual to sustain his/her decisions and drives the individual towards achieving the set goals. In order to flourish and survive, organizations must drive the need to concentrate on stimulating self-discipline at work (Fowers, 2008). The lack of self-discipline among workers may result to distressing thoughts, negativity and lack of enthusiasm at work, which adversely affect productivity of the employee and the organization at large. Leader and managers of organization need to admit the fact that self-discipline cannot be learnt transferred and fulfilled overnight. An organization benefit greatly when its employees

demonstrate some measures of self-discipline at work. In fact, self-discipline at work promotes strong relationships to succeed and raises an environment of commitment, dedication, keenness and devotion amongst the employees which ultimately results in improved organizational productivity. Wotruba et al. (2001) indicated that self-discipline at work can be sustained by making sure that employees are cleared about performance expectations in order to sustain their focus towards the accomplishment of work assigned to them.

Self-discipline involves giving greater commitment to work without being coerced, compelled and intimidated; relaying information to others; keeping them informed and updated; assuming responsibilities; caring for others' interests etc. (Arvey and Jones, 2005). Self-discipline is not influenced and imposed from supervisors or managers rather it comes from one's attitude. When individual in an organization have this attitude, it shapes and develops the culture of self-discipline which will ultimately lead to increased productivity. The productivity can be affected adversely when individuals are overwhelmed with laziness, negligence, irresponsibility, favoritism, self-interest and lack of self-determination. Apparently, if managers and employees are not self-disciplined, hence the organization will become a lawless community which will eventually make increased productivity far from sight (Aniele, 2004). Ethical consideration in labor management relationship is a concomitant for organizational development. For high productivity, it is important that all stakeholders observe ethical conducts in their dealings with one another. This must be openly displayed through positive attitudes, committed teamwork, high integrity and self-discipline (Mestre et al., 1997).

Employees work attitude tends to be favourable when organizations facilitate industrial harmony, affection, recognition, friendliness, freedom that are crucial for enhancing organizational productivity (Ogunbameru, 2004). However, where these are ignored, intention leave, sabotage, absenteeism, labour turnover, low morale and productivity becomes a common phenomenon. Obasi (2003) argued that unfavorable work attitude could come as a result of poor relationship with a leaders/manager, lack of recognition and flextime, inequality, inconsistent promotion and payment of salary, lack of training, development and career opportunities. Increased industrial hazard, inadequate employment protection etc. can be the push factor behind an individual's attitudes towards organizational productivity (Salau et al., 2014). An individual that is not satisfied with the pay, working environment, ethical values, culture, company policy and processes may exhibit some attitudes that could be detrimental to organizational productivity. When productivity is adversely affected, then achievement of corporate objective suffers which will eventually make profit maximization unattainable (Kate and Masako, 2002). Therefore, the success of every organization is a dependent factor on employees' attitude towards increasing productivity of the organization.

In the context of Nepal, Pradhan (2019) examined the impact of human resource management practices on organizational performance. The study found that training and development, communication, performance appraisal, career planning, employee participation, compensation and job definition have significant impact on organizational performance. In addition, Nepalese civil services sector has increasingly become dysfunctional, fragmented, poorly organized, and incapable of performing at a level acceptable to the public. In recent years, Nepalese civil service has become too much politicized which has contributed to the promotion of unethical practices in civil service. As a result, moral and ethical values in civil services are in the state of deterioration, causing services delivery to suffer (Shakya, 2009).

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of work ethics on organizational productivity. 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 impact of work ethics on the productivity of Nepalese commercial banks. More specifically, it examines the impact of corruption, self-discipline, communication, morality, integrity and co-ordination on organizational productivity in the context of Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on the primary data. The data were gathered from 114 respondents through questionnaire. The respondents' views were collected on corruption, self-discipline, communication, morality, integrity and co-ordination in Nepalese commercial banks. The study is based on descriptive and causal comparative research designs. Table 1 shows the number of commercial banks selected for the study along with the number of respondents.

**Table 1:** List of commercial banks selected for the study along with the number of respondents

| S. N.                              | Name of the commercial banks          | Number of respondents |
|------------------------------------|---------------------------------------|-----------------------|
| 1                                  | Global IME Bank Limited               | 8                     |
| 2                                  | NIC Asia Bank Limited                 | 15                    |
| 3                                  | Citizens Bank International Limited   | 3                     |
| 4                                  | Himalayan Bank Limited                | 11                    |
| 5                                  | Laxmi Bank Limited                    | 10                    |
| 6                                  | Bank of Kathmandu Limited             | 2                     |
| 7                                  | Prime Bank Limited                    | 6                     |
| 8                                  | Everest Bank Limited                  | 5                     |
| 9                                  | Nepal SBI Bank Limited                | 4                     |
| 10                                 | NCC Bank Limited                      | 1                     |
| 11                                 | Civil Bank Limited                    | 2                     |
| 12                                 | Rastriya Banijya Bank Limited         | 5                     |
| 13                                 | Nabil Bank Limited                    | 8                     |
| 14                                 | Nepal Bank Limited                    | 2                     |
| 15                                 | Sanima Bank Limited                   | 3                     |
| 16                                 | Siddharth Bank Limited                | 4                     |
| 17                                 | NMB Bank Limited                      | 5                     |
| 18                                 | Machhapuchhre Bank Limited            | 4                     |
| 19                                 | Sunrise Bank Limited                  | 3                     |
| 20                                 | Kumari Bank Limited                   | 4                     |
| 21                                 | Century Commercial Bank Limited       | 2                     |
| 22                                 | Standard Chartered Bank Nepal Limited | 3                     |
| 23                                 | Mega Bank Nepal Limited               | 1                     |
| 24                                 | Nepal Bangladesh Bank Limited         | 3                     |
| <b>Total number of respondents</b> |                                       | <b>114</b>            |

Thus, the study is based on 114 respondents



## The model

The model estimated in this study assumes that organizational productivity depends on corruption, self-discipline, communication, morality, integrity and co-ordination. Therefore, the model takes the following form:

$$OP = \beta_0 + \beta_1 COR + \beta_2 COM + \beta_3 MOR + \beta_4 INT + \beta_5 CORD + \beta_6 SELD + e$$

Where,

OP = Organizational productivity

COR = Corruption

COM = Communication

MOR = Morality

INT = Integrity

SELD = Self-discipline

CORD = Coordination

Corruption 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 “Practicing corruption created unfavorable and inefficient work environment,” “Corruption demotivates disciplined workers to not perform their task efficiently” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.889$ ).

Communication 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 organization I work in has a good flow of communication,” “Communication improves employee’s ability to perform more efficiently” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.937$ ).

Morality 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 is guided by high standards of morality,” “I am clear about my personal values (my convictions of what is right and wrong, of what is important, and so on)” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.935$ ).

Integrity 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 support reporting of any unlawful and unethical practice in an organization,” “My organization treats employees with human rights and respect” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.873$ ).

Self-discipline 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 “Self-discipline promotes work ethics in the organization”, “I have clear understanding and love working in a disciplined environment” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.889$ ).

Coordination 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

“Coordination improves employee performance and supports job loyalty,” “The organization I work in has a good coordination between employees” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.903$ ).

Organizational productivity 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 “Organizational productivity determines organization development and growth”, “Organization productivity is not just about outcome of an organization but good system and employees” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.891$ ).

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

## Corruption

Corruption undermines people beliefs to their ability and causing frustration and disillusionment. Corruption leads to higher prices of transactions, disrupts sustainable development and restricts the possibility of predicting economic status (Kostadinova, 2009). Any action that was in contrary with laws and regulations, and there is a motivation for personal benefit, will be considered corruption (Pelletier and Bligh, 2008). Esmali et al. (2013) assessed the relationship between administrative corruption and HR productivity. The finding showed that administrative corruption is one of the components which affect the HR productivity. The result also showed that administrative corruption has a negative correlation with all of productivity components; such as job satisfaction, job security, and accuracy of actions, the speed rate of employees’ performance, job knowledge and quality of work life. Similarly, Brzic et al. (2021) examined the relationship of corruption and the fraction of private ownership on their productivity. The study concluded that higher levels of perceived corruption have a negative relationship with company’s productivity. Likewise, Lu et al. (2021) examined the impact of corruption on firm productivity in China. The study showed that corruption in China negatively impacts firm productivity by increasing the prices of imported intermediate inputs, reducing the number of imported varieties, and hindering productivity gains from import liberalization, especially for small, private, and productive firms. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is negative relationship between corruption and organizational productivity.

## Self-discipline

Self-discipline is concerned with self-control of the individual to adjust to certain need and demands. Sule-Dan and Ilesanmi (2015) examined the role of discipline on organizational effectiveness in the public sector with specific reference to Nigeria Customs Service. The study concluded that discipline should start by having self-discipline and discipline should not be seen as punitive measure but also as a means to correct and enforcement of standards in the organization. The study also showed a positive relationship between self-discipline and organizational productivity. Moreover, Bataineh (2020) explored how work ethics (through work ethics elements: integrity, responsibility, equality and self-discipline) effects on employee’s job performance in SMEs in Al-Hassan Industrial Estate. The results showed that work ethics improved employee’s job performance in SMEs in Al-Hassan Industrial Estate. Moreover, the elements of work ethics (integrity, responsibility, equality and self-discipline) also improved employee’s job performance and

organizational productivity. Furthermore, Luo et al. (2008) confirmed a positive effect of self-discipline on job performance of Chinese military soldiers. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is positive relationship between self-discipline and organizational productivity.

## Communication

Communication is a crucial factor for organizational success, vigor and source of harmonization as it transfers information to a larger group of people in the organization. Haroon and Malik (2018) explored the impact of organizational communication on organizational performance in the universities. The results revealed that university may adopt effective and appropriate means of communication to address academic and nonacademic problems and issues which ultimately affect organizational performance. Communication plays important role in decision making. It lends the requisite facts and data that individuals and groups require making decisions, to boost performance of a team, and the information to choose and weigh other alternatives. This will ultimately result in higher individual performance and increased productivity (Stephen, 2011). There is a powerful relationship between organizational communication and performance of an organization when an appropriate medium of communication prevails between organizational elements. This medium of communication medium is adherent with the progress and achievements of the organization and it deals with bugs being occurred during the communication process. Ultimately, the organization becomes genuine and indiscriminate combination of benevolence, as a classical organization (Roberts, 1984). Johnston et al. (2007) concluded that the business strategies such as customer orientation, employee autonomy, effective communication, training and development, job satisfaction etc. play an important role in organizational performance. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is positive relationship between communication and organizational productivity.

## Morality

Many employees take benefit of strengthening spirituality in work, to increase faith and improvement of morality and spirit. Fry and Matherly (2006) stated that organizational commitment, job performance, job satisfaction and high productivity endurance is an evident feature of work and leadership spirituality and morality at organizational level. Today organizations are deliberately seeking leadership spirituality and morality that would influence in prevailing the intrinsic motivation, inspiration, moral, ethical and altruistic values that compel an organization towards vision accomplishment. The leadership spirituality promulgates the subordinates with rationality, morality, nobleness, meaning accomplishment, group thinking, sociability and mutual collaboration at organizational level (Karakas, 2010). This will result in higher organizational productivity and increase job satisfaction. The behavior, attitude, morality and ethical wellbeing of individuals that incorporates self-realization along with the job satisfaction and organizational commitment have positive impact on organizational productivity (Beekun and Badawi, 2005). Moral behavior or behaving respectfully with others, honesty and truthfulness, commitment to an ethical system, justice or impartial behavior with others etc. promotes team work and sound relationship within the organization and helps in enhancing the efficiency and productivity (Giacalone and Jurkiewicz, 2003). Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is positive relationship between morality and organizational productivity.

## Integrity

According to Pelletier and Bligh (2008), integrity is an essential element in the decision by employees to become engaged in knowledge exchange process. The study argued that integrity is important because technology, infrastructure, and management influence individually are not enough to facilitate the flow of communication. Self-discipline, communication and integrity positively affects morale, productivity, and the overall effectiveness of the organization (Morgan and Zeffane, 2003). Employee complaints, union grievances, slow production, hostile environments, and atmosphere are a result of manager personality and employee perception that visibly affects employee productivity (Westover et al., 2010). The study also showed a positive effect of integrity and self-discipline on organizational productivity. Dobbs et al. (2019) examined the impact of perceived leader and organizational integrity on extra-role behaviors. The study found a positive effect of perceived leader and organizational integrity on employee performance and organizational productivity. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is positive relationship between integrity and organizational productivity.

## Coordination

Co-ordination is characterized by frequent, timely, problem-solving communication, shared goals, shared knowledge and mutual respect. Gittell (2000) addressed how organizations achieve, or fail to achieve, high levels of relational coordination. The study found significant positive correlations between relational coordination and the use of cross-functional liaisons, cross-functional performance measurement, employee selection, conflict resolution, productivity and flexible work roles. Hunter (2002) examined the impact of use of effective elements of organizational structure on organizational performance. The study revealed that there is a significant effect of organization structure, communication and coordination among the employees on the organizational performance. Nooteboom (2000) revealed that there is a significant positive association between coordination and organizational performance. Furthermore, Mbiya et al. (2014) assessed the effects of training practices on employee's productivity in the public service of National Government, Kakamega Central Sub County. The study showed that training, communication and employee coordination have positive effect on the employee productivity. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is positive relationship between coordination and organizational productivity.

# 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 2.

**Table 2:** Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 114 observations. The dependent variable is OP (Organizational productivity). The independent variables are COR (Corruption), SELD (Self-discipline), COM (Communication), MOR (Morality), INT (Integrity) and CORD (Co-ordination).

| Variables   | Mean  | SD    | OP       | COR     | SELD    | COM     | MOR     | INT     | CORD |
|-------------|-------|-------|----------|---------|---------|---------|---------|---------|------|
| <b>OP</b>   | 3.754 | 0.967 | 1        |         |         |         |         |         |      |
| <b>COR</b>  | 3.656 | 1.016 | -0.478** | 1       |         |         |         |         |      |
| <b>SELD</b> | 3.787 | 0.963 | 0.545**  | 0.488** | 1       |         |         |         |      |
| <b>COM</b>  | 3.717 | 0.996 | 0.520**  | 0.385** | 0.629** | 1       |         |         |      |
| <b>MOR</b>  | 3.577 | 0.892 | 0.493**  | 0.461** | 0.429** | 0.532** | 1       |         |      |
| <b>INT</b>  | 3.68  | 0.928 | 0.481**  | 0.449** | 0.444** | 0.498** | 0.523** | 1       |      |
| <b>CORD</b> | 3.645 | 0.903 | 0.559**  | 0.463** | 0.461** | 0.493** | 0.473** | 0.579** | 1    |

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

Table 2 shows that corruption is negatively correlated to organizational productivity. It implies that increase in corruption practices in organization leads to decrease in bank productivity. The result also reveals that self-discipline is positively correlated to organizational productivity. It implies that self-disciplined employees lead to higher organizational productivity. Similarly, communication is positively correlated to organizational productivity. It indicates that better communication leads to higher level of organizational productivity. Likewise, the result also shows that morality is positively correlated to organizational productivity. It implies that high morality in employees leads to increase in organizational productivity. Furthermore, integrity is positively correlated to organizational productivity. It indicates that high integrity in employees leads to higher organizational productivity. Moreover, the result also shows that coordination is positively correlated to organizational productivity. It implies that better coordination between the employees leads to increase in organizational productivity.

## Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 3. More specifically, it presents the regression results of corruption, self-discipline, communication, morality, integrity and co-ordination on organizational productivity in Nepalese commercial banks.

**Table 3:** Estimated regression results of corruption, self-discipline, communication, morality, integrity, co-ordination on organizational productivity

The results are based on 114 observations using linear regression model. The model is  $OP = \beta_0 + \beta_1 COR + \beta_2 SELD + \beta_3 COM + \beta_4 MOR + \beta_5 INT + \beta_6 CORD + e$ , where the dependent variable is OP (Organizational productivity). The independent variables are COR (Corruption), SELD (Self-discipline), COM (Communication), MOR (Morality), INT (Integrity) and CORD (Co-ordination).

| Model | Intercept          | Regression coefficients of |                     |                     |                     |                     |                     | Adj. R_bar² | SEE   | F- value |
|-------|--------------------|----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------------|-------|----------|
|       |                    | COR                        | SELD                | COM                 | MOR                 | INT                 | CORD                |             |       |          |
| 1     | 1.012<br>(4.819)** | -0.750<br>(13.577)**       |                     |                     |                     |                     |                     | 0.618       | 0.598 | 183.780  |
| 2     | 0.619<br>(2.947)** |                            | 0.828<br>(15.392)** |                     |                     |                     |                     | 0.676       | 0.550 | 236.912  |
| 3     | 0.849<br>(4.055)** |                            |                     | 0.782<br>(14.366)** |                     |                     |                     | 0.645       | 0.576 | 206.394  |
| 4     | 0.755<br>(3.149)** |                            |                     |                     | 0.839<br>(12.899)** |                     |                     | 0.594       | 0.616 | 166.373  |
| 5     | 0.702<br>(3.099)** |                            |                     |                     |                     | 0.829<br>(13.898)** |                     | 0.630       | 0.588 | 193.154  |
| 6     | 0.482<br>(2.328)*  |                            |                     |                     |                     |                     | 0.898<br>(16.262)** | 0.700       | 0.530 | 264.440  |
| 7     | 0.447<br>(2.263)*  | -0.347<br>(4.521)**        | 0.538<br>(6.637)**  |                     |                     |                     |                     | 0.724       | 0.508 | 149.230  |
| 8     | 0.366<br>(1.911)*  | -0.315<br>(4.236)**        | 0.294<br>(2.717)**  | 0.303<br>(3.256)**  |                     |                     |                     | 0.746       | 0.487 | 111.626  |
| 9     | 0.208<br>(1.066)   | -0.249<br>(3.248)**        | 0.276<br>(2.623)**  | 0.207<br>(2.124)*   | 0.230<br>(2.662)**  |                     |                     | 0.759       | 0.474 | 90.125   |
| 10    | 0.155<br>(0.793)   | -0.211<br>(2.706)**        | 0.243<br>(2.302)*   | 0.179<br>(1.837)    | 0.162<br>(1.753)    | 0.181<br>(1.922)    |                     | 0.765       | 0.467 | 74.620   |
| 11    | 0.070<br>(0.372)   | -0.155<br>(2.012)*         | 0.172<br>(1.670)    | 0.175<br>(1.884)    | 0.119<br>(1.340)    | 0.043<br>(0.439)    | 0.337<br>(3.336)**  | 0.785       | 0.448 | 69.869   |

**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. Organizational productivity is the dependent variable.

The regression results show that the beta coefficients for corruption are positive with organizational productivity. It indicates that corruption has a positive impact on organizational productivity. This finding is similar to the findings of Esmaili et al. (2013). Likewise, the beta coefficients for self-discipline are positive with organizational productivity. It indicates that self-discipline has a positive impact on organizational productivity. This finding is consistent with the findings of Bataineh (2020). Moreover, the beta coefficients for communication are positive with organizational productivity. It indicates that communication has a positive impact on organizational productivity. This finding is similar to the findings of Johnston et al. (2007). Furthermore, the beta coefficients for morality are positive with organizational productivity. It indicates that morality has a positive impact on organizational productivity. This finding is consistent with the findings of Karakas (2010). In addition, the beta coefficients for integrity are

positive with organizational productivity. It indicates that integrity has a positive impact on organizational productivity. This finding is similar to the findings of Dobbs et al. (2019). Moreover, the beta coefficients for co-ordination are positive with organizational productivity. It indicates co-ordination has a positive impact on organizational productivity. This finding is similar to the findings of Hunter (2002).

## 4. Summary and conclusion

In a competitive environment, organizations must be able to take advantage from opportunities and take away threats in order to using their abilities to response appropriately to market needs. Thus, organizations are always tried to increase their personnel's' productivity by efficient using of new technology to achieve their goals with greater efficiency. Unethical activities and corruption are the main obstacle for economic growth, organizational productivity, improving living standards and efficiency of the people. The performance of any company is affected by the work ethics that exist in its employees. Having a good work ethic causes the employees to make physical, mental, and emotional efforts in his work to fulfil and even exceed expectations.

This study attempts to examine the impact of work ethics on the organizational productivity in the context of Nepalese commercial banks. The study is based on primary data collected from 24 commercial banks with 114 respondents.

The study showed that self-discipline, communication, morality, integrity and co-ordination have positive impact on organizational productivity. Moreover, corruption has a negative impact on organizational productivity in the context of Nepalese commercial banks. The study concluded that better work ethics in the organization leads to increase in employee motivation and increase organizational productivity. The study also concluded that co-ordination followed by self-discipline is the most influencing factor that determines the organizational productivity in the context of Nepalese commercial banks.

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## Abstract

*This study examines the relationship between reward, employee motivation and turnover intention in the context of Nepalese commercial banks. Turnover intention and employee motivation are the dependent variables. The selected independent variables are salary, bonus and commission, promotion, training and development, recognition and autonomy support. The primary source of data is used to assess the opinions of the respondents regarding level of motivation and turnover intention in Nepalese commercial banks. The study is based on primary data of 27 commercial banks with 200 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 reward on employee motivation and turnover intention in the context of Nepalese commercial banks.*

*The study showed that salary has a positive impact on employee motivation. It implies that increase in salary leads to increase in employee motivation. However, salary has a negative impact on employee turnover intention. It implies that increase in salary leads to decrease in employee turnover intention. The result also revealed that bonus and commission have positive impact on employee motivation. It implies that better the bonus and commission, higher would be the employee motivation. In contrast, bonus and commission have negative impact on employee turnover intention. It implies that better the bonus and commission, lower would be the employee turnover intention. Moreover, training and development program have positive impact on employee motivation indicating that better the training and development programs, higher would be the employee motivation. Furthermore, recognition has a positive impact on employee motivation indicating that better recognition in the bank leads to increase in employee motivation. Similarly, the result also showed that autonomy support has a positive impact on employee motivation. It indicates that increase in autonomy support leads to increase in employee motivation. However, training and development program have negative impact on employee turnover intention indicating that better the training and development programs, lower would be the employee turnover intention. Similarly, the result also showed that autonomy support has a negative impact on employee turnover intention. It indicates that increase in autonomy support leads to decrease in employee turnover intention.*

**Keywords:** Reward, salary, bonus and commission, promotion, training and development, recognition, autonomy support, employee motivation and turnover intention.

# 1. Introduction

In the competitive business climate, employees are becoming important assets in the organization. Employees' commitment determines organizational performance and survival. Employees are expected to fulfil organizations needs and objectives (Arokiasamy et al., 2010). Many organizations are putting high expectations beyond the employees' capabilities. From an organization point of view, retaining the best employees are equally important with keeping pace with technological advances (Dawley et al., 2010). According to Kuean et al. (2010), it is an open secret that employers are competing with each other in the labor market to get an efficient, creative and innovative employees in order to sustain their competitive advantage. Human resource is the most important resources in the organization. Making an effort to retain skilled and efficient workforce is very essential for the achievement of the organizational objective. The commercial banks play important roles in worldwide economies and their employees are the best sources of delivering good services to their customers. Excellent services provided and offered by employees can create a positive perception and ever lasting image in the eyes of bank customers. The motivation of a bank employee plays a major role in achieving high level of satisfaction among its customers (Adu et al., 2016). Organizations should balance the intrinsic and extrinsic components of the rewards. Motivation is such a factor that exerts a driving force on the actions and work. According to Baron (1990), motivation is an accumulation of different processes which influence and direct our behavior to achieve some specific goal. It is such a dynamic in today's environment that explicitly creates and encompasses a positive impact on job. Within an organization, the best performance is feasible with most committed employees that can only be achieved through employee motivation.

Employee turnover is potentially costly and may have negative implications whether it is voluntarily, such as resignations or involuntarily, such as termination initiated by the employer. The possible negative impact of turnover to organizations might be due to high cost of recruiting, training and getting new employees, productivity loss during replacement search and retaining, loss of high performers or high-skilled workers, and disruption of social and communication structures. Abbasi et al. (2008) added that the effect of turnover towards the organization is not only in terms of cost of termination, recruitment, selection, and advertising, but it also reflects the ability of the remaining employees to complete their mounting duties or accumulated works in the organization. Samad (2006) stated that the personal costs of turnover may impede to employees not only in the form of loss of friendship and benefits but perhaps a disruption of the family. Foster et al. (2011) argued that dissatisfied and frustrated employees in an organization are likely to exhibit higher career plateau tendencies and intention to leave than satisfied employees. Th study further added that the employees are not likely to be committed and loyal to their organization. Hellman (1997) shared the same view that the increasing of dissatisfaction in employees results in a higher chance of considering other employment opportunities. According to Thatcher et al. (2003), there was a positive correlation between perceived alternative job opportunities and turnover intention. If organizations fail to provide substantial growth opportunities, then the employees actively search for an alternative job and their search is based upon the perceived opportunities in external market (Mano-Negrin and Tzafrir, 2004). In addition, Jo (2008) added that if an employee decides to move to another job to get more money, monetary incentives such as pay raises and bonuses will be the most common and costly way to prevent turnover. If they find the possible alternatives, job-seeking employees compare them with their present employment and either decide to stay or leave. According to Knight and Leimer (2010), available job alternatives can lead to both a committed and an exploratory intent search and then quit.

Employee satisfaction and motivation are the central issues among other business issues of every organization globally (Akafo and Boateng, 2015). As the employee strengths are considered as competitive advantage of the organization, modern organizations emphasize on human elements for the organizational effectiveness to ensure long term success. Turnover intention refers to the results of individual evaluations regarding the continuation of his or her relationship with a company that has not been realized in action to leave the company. Reward is all income in the form of money, goods directly or indirectly received by employees in return or services provided to the company (Berliana et al., 2018). Asaari et al. (2019) explained that rewards are all forms of payroll or reward to employees who arise because of their employment. At a minimum, employees expect their organization to provide fair pay, safe working conditions, and fair treatment (Wyatt and Wah, 2001). Salary plays an important role in ensuring that the employees are motivated, loyal and sincere to their work. Wasiu and Adebajo (2014) stated that when employers pay low salaries and payment methods are not fixed, it will affect the performance of employees. Employee performance will decline because employees will not be satisfied.

Igalens and Roussel (1999) examined the effects of monetary compensation on turnover intention with intrinsic and extrinsic motivation as mediators. The study found that there is a negative relationship between annual performance pay and employee motivation. Ghazanfar et al. (2011) showed a positive association between pay and employee motivation. Springer (2011) revealed that there is negative relationship between promotion and turnover intention. Kuvaas et al. (2016) confirmed that there is positive and significant relationship between promotion and employee motivation. Van Herpen et al. (2005) highlighted training as an essential element to an employee for the development of the companies because some of the employees have a lack of knowledge skills and competencies and failed to accomplish the task on a timely basis. According to Pouliakas (2014), training has significant effect on employee's motivation. According to Drake et al. (2007), employee recognition has significant impact on turnover intention. Brammer and Millington (2008) revealed that there is a significant and positive relationship between recognition and employee's motivation. Gerhart and Fang (2014) assessed the effect of perceived organizational support and perceived supervisor support on employee turnover. The study found that there is strong negative relationship between organizational and supervisor support and employee turnover intention. Landry et al. (2017) examined the impact of employee motivation on turnover intention. The study showed that there is a negative relationship between monetary and non-monetary rewards and turnover intention.

In the context of Nepal, Yukongdi & Shrestha (2020) revealed that the significant factors that would influence employees to quit include lack of career growth opportunities, lack of timely promotion, compensation commensurate with higher position, working environment, extreme work pressure, work relationships with supervisors and co-workers, motivational factors, the nature of jobs, lack of work-life balance, and behavior of management towards employees. Moreover, Thagunna (2020) examined the factors impacting employees' performance in Nepalese commercial banks. The study showed that organizational culture, physical work environment, work-life balance, supervisor support and workplace incentives have positive impact on employees' performance in Nepalese commercial banks. Furthermore, Gautam (2019) investigated the effect of reward system on employee motivation and turnover intention. The study found that better reward system has significant positive relationship with employee motivation. Similarly, the result also revealed a negative significant relationship between employee motivation and their turnover intention.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the relationship between reward, employee motivation and turnover intention. 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 reward, employee motivation and turnover intention in Nepalese commercial banks. More specifically, it examines the impact of salary, bonus and commission, promotion, training and development, recognition and autonomy support on employee motivation and turnover intention 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.

## 1. Methodological aspects

The study is based on the primary data. The data were gathered from 200 respondents through questionnaire. The respondents' views were collected on salary, bonus and commission, promotion, training and development, recognition, autonomy support and level of motivation in Nepalese commercial banks. The study is based on descriptive and causal comparative research designs. Table 1 shows the number of commercial banks selected for the study along with the number of respondents.

**Table 1:** List of commercial banks selected for the study along with the number of respondents

| S.N. | Name of the banks                      | Observations |
|------|----------------------------------------|--------------|
| 1    | Rastriya Banijya Bank Limited          | 11           |
| 2    | Nepal Credit and Commerce Bank Limited | 9            |
| 3    | Himalayan Bank Limited                 | 7            |
| 4    | Everest Bank Limited                   | 5            |
| 5    | Machhapuchchhre Bank Limited           | 10           |
| 6    | Kumari Bank Limited                    | 3            |
| 7    | Laxmi Bank Limited                     | 9            |
| 8    | Global IME Bank limited                | 9            |
| 9    | Mega Bank Nepal Limited                | 4            |
| 10   | Nabil Bank Limited                     | 14           |
| 11   | Nepal Bangladesh Bank Limited          | 3            |
| 12   | Nepal Bank Limited                     | 13           |
| 13   | Nepal Investment Bank Limited          | 8            |
| 14   | Nepal SBI Bank Limited                 | 6            |
| 15   | NIC Asia Bank Limited                  | 15           |
| 16   | NMB Bank Nepal Limited                 | 6            |
| 17   | Prabhu Bank Limited                    | 6            |
| 18   | Prime Commercial Bank Limited          | 10           |
| 19   | Agricultural Development Bank Limited  | 8            |
| 20   | Sanima Bank Limited                    | 4            |
| 21   | Siddhartha Bank Limited                | 3            |
| 22   | Bank of Kathmandu Limited              | 3            |



|    |                                       |            |
|----|---------------------------------------|------------|
| 23 | Citizens Bank International Limited   | 7          |
| 24 | Standard Chartered Bank Nepal Limited | 5          |
| 25 | Century Commercial Bank Limited       | 7          |
| 26 | Civil Bank Limited                    | 10         |
| 27 | Everest Bank Limited                  | 5          |
|    | <b>Total number of respondents</b>    | <b>200</b> |

Thus, the study is based on 200 respondents

## The model

The model estimated in this study assumes that the employee motivation and turnover intention depends on salary, bonus and commission, promotion, training and development, recognition and autonomy support. Therefore, the model takes the following form:

$$\begin{aligned}
 EM &= \beta_0 + \beta_1 SA + \beta_2 BC + \beta_3 PR + \beta_4 TD + \beta_5 RC + \beta_6 AS + e \\
 T_1 &= \beta_0 + \beta_1 SA + \beta_2 BC + \beta_3 PR + \beta_4 TD + \beta_5 RC + \beta_6 AS + \beta_7 EM + e
 \end{aligned}$$

Where,

|    |   |                          |
|----|---|--------------------------|
| EM | = | Employee motivation      |
| TI | = | Turnover intention       |
| SA | = | Salary                   |
| BC | = | Bonus and commission     |
| PR | = | Promotion                |
| TD | = | Training and development |
| RC | = | Recognition              |
| AS | = | Autonomy support         |

Salary was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I receive right amount of salary for my work”, “Salary in this bank is satisfactory” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.869$ ).

Bonus and commission 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 “My company provides me satisfactory allowances with rising inflation, time to time,” “The most important factor that makes me perform well at my job is when my salary and other financial benefits are paid regularly” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.784$ ).

Promotion was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I feel that management will be fair and ethical while promoting any employee based on performance,” “Getting promotion is faster and easy depending on performance” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.833$ ).

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

items include “I have been encouraged to work through the training provided by the organization,” “I have been given various sorts of training regularly by bank” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.768$ ).

Recognition 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 praised regularly for my work,” “The primary value of recognition is acknowledgement of performance by management” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.842$ ).

Autonomy support was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “My managers help me to solve disagreement with my colleague and customers”, “My boss or someone at work seems to care about me as a person” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.856$ ).

Employee motivation was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “My colleagues appreciate me for what I did for my work,” “I see myself as an important employee of the organization” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.863$ ).

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 “As soon as I find a better job, I will leave this job”, “I don’t feel any obligation to remain with my current employer” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.728$ ).

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

## Salary

Salary level has a significantly positive effect on organizational commitment (Folger and Konovsky, 1989). This results in reducing the turnover intention. Different studies found a similar results that higher salary leads to increased employee commitment and reduced turnover intention (Ghiselli et al., 2001; Summers and Henfrix, 1991). It is apparent that the effect of work environment, salary level, and coworker relationships are important to decrease the turnover intention (Robbins, 2003). Salary has a positive effect on employee job satisfaction. In addition, employees with high job satisfaction levels have a higher level of work efficiency, organizational commitment, and willingness to sacrifice for the organization, making it more difficult for them to leave their jobs (Bartle et al., 2002; Parker and Kohlmeyer, 2005). Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is positive relationship between salary and employee motivation.

H<sub>2</sub>: There is negative relationship between salary and turnover intention.

## Bonus and commission

Extrinsic rewards include things like salaries, bonuses commissions, perks, benefits, and cash awards are negatively correlated to turnover intention (Flynn, 1999). If employees are managed appropriately i.e., job analysis, recruitment, training, motivational tools like compensation, bonuses, commission etc., they are destined to give high performance in their operations and will improve the overall productivity of the organization (Ichniowski, 1997). This helps in retaining and motivating the employees in the organization. From an organizational perspective, the aim of bonus and commission is to attract, motivate and retain high-quality employees as well as to foster high levels of performance (Lawler 1990; Gomez-Mejia et al., 2004). Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is positive relationship between bonus and commission and employee motivation.

H<sub>4</sub>: There is negative relationship between bonus and commission and turnover intention.

## Promotion

Promotion refers to a higher post carrying greater responsibilities, higher status, and better salary. It is the upward movement of an employee in the organization's hierarchy. Kathina and Bula (2021) showed a positive association between promotion of employees and job loyalty in Kenyan commercial banks. According to Kreitner (2004), promotion should aim at recognizing the best talent in the firm such employees should be promoted to senior positions and promotion should also provide career advancement opportunities to employees according to the available opportunities and the employees abilities. Most employees evaluate themselves at a high level and feel that their work should be recognized. Promotion is used for rewarding good performance, recognizes worker capabilities and used in firms as a staff development mechanism (Pousa & Mathieu, 2010). It enables retention of employees as a laid down succession plan that is clear for the workforce, motivates them and encourages better performance and a long-term commitment to work for the organization. Employees who work for firms that use the promotion strategy also feel that they have job security. Satisfaction is also another benefit of promotion which leads to more loyal employees. The employer should know various employees' achievements as well as interests and provide skills building programs in various areas to assist employees move up (Mehta, 2014). This results in retention of good employees and reduce the turnover intention. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is positive relationship between promotion and employee motivation.

H<sub>6</sub>: There is negative relationship between promotion and turnover intention.

## Training and development program

Training and development are a function within human resources management used to fulfill the gaps between current and expected performance (Elnaga & Imran, 2013). Training is planned and systematic activities which are focused on enhancing the level of skills, knowledge, and competency (Rodriguez & Walters, 2017). It is the process of conveying essentials skills, programmed behavior, so individuals become aware of rules and procedures to guide their own behavior to accomplish their job effectively. According to Elnaga and Imran (2013), this effort assists individuals in decreasing their anxiety or frustration encountered in the workplace. When a task is not properly performed and the end results are not perceived as expected, the individual may not feel motivated to keep performing (Asim, 2013). Individuals who are not able to perform at the expected level of performance may even decide to leave the organization, because

they feel they are not productive and become dissatisfied with their job. For this reason, employee training and development serves as the tool that not only enhances the competencies required to perform a job, but it also provides the means to assist individuals in feeling more satisfied with the results of their performance. Employee training and development is a vital component of human resources planning activities, because it not only maximizes the efficiency of individuals, but it may also attract better talent and retain within the organization (Bapna et al., 2013). Based on it, this study develops the following hypothesis:

H<sub>7</sub>: There is positive relationship between training and development and employee motivation.

H<sub>8</sub>: There is negative relationship between training and development and turnover intention.

## Recognition

Recognition mostly refers to the formal program like employee of the year. Employers in many countries use recognition program such as long service award or loyalty award for employees who complete many years. Such an action enhances the retention of employees in industries where turnover rate is high (Kathina and Bula, 2021). Rewards and recognition play an imperative role in motivating employees and improving performance (Lawler, 2003). Incentives, rewards and recognitions are the prime factors that impact on employee motivation. Zakaria et al. (2011) contended that employees who are well motivated serve as the competitive advantage for any company and have less intention to leave the company. Organizations in today's environment seek to determine the reasonable balance between employee commitment and performance of the organization. The reward and recognition programs serve as the most contingent factor in keeping employees' self-esteem high, motivated and passionate (Ahmed, 2011). Based on it, this study develops the following hypothesis:

H<sub>9</sub>: There is positive relationship between recognition and employee motivation.

H<sub>10</sub>: There is negative relationship between recognition and turnover intention.

## Autonomy support

Having autonomy is very important to employees. People have a strong need to control their lives and to participate in making decisions that affect them. Deci et al. (2001) found that autonomy was related to higher levels of job satisfaction and commitment and fewer thoughts of quitting. Guntert (2015) examined the impact of work design, autonomy support, and strategy on employee outcomes. The study found a positive relationship between work design, autonomy support and employee motivation. Moreover, Nie et al. (2015) assessed the importance of autonomy support and the mediating role of work motivation for well-being in a Chinese work organization. The study found a positive effect of autonomy support on the work motivation and negative effect on the turnover intention. Based on it, this study develops the following hypothesis:

H<sub>11</sub>: There is positive relationship between autonomy support and employee motivation.

H<sub>12</sub>: There is negative relationship between autonomy support and turnover intention.

## Employee motivation

Motivation plays a vivacious role in increasing or decreasing the performance of the employees. When the employees are less motivated, they become fed about their job and there are more chances of their left.

Omolo (2015) examined the impact of job satisfaction on employee motivation and turnover intentions. The study found that job satisfaction results in increased motivation and lower or reduced turnover intentions. Zameer et al. (2014) argued that motivation have positive relationship with employee performance because as the motivation increases the employee performance also increases and vice versa. This results in lower in turnover intention of the employees. Uzonna (2013) stated that motivation has negative relationship with employee turnover because as the motivation increases, the employee turnover decreases and vice versa.

H<sub>13</sub>: There is negative relationship between employee motivation and turnover intention.

### 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 2.

**Table 2:** Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 200 observations. The dependent variables are EM (Employee motivation) and TI (Turnover intention). The independent variables are SA (Salary), BC (Bonus and commission), PR (Promotion), TR (Training and development), RC (Recognition) and AS (Autonomy support).

| Variables | Mean  | SD    | EM      | TI       | SA      | BC      | PR      | TD      | RC      | AS |
|-----------|-------|-------|---------|----------|---------|---------|---------|---------|---------|----|
| EM        | 3.539 | 0.773 | 1       |          |         |         |         |         |         |    |
| TI        | 3.425 | 0.612 | -0.006  | 1        |         |         |         |         |         |    |
| SA        | 3.405 | 0.723 | 0.285** | -0.061   | 1       |         |         |         |         |    |
| BC        | 3.555 | 0.676 | 0.634** | -0.076   | 0.139** | 1       |         |         |         |    |
| PR        | 3.488 | 0.721 | 0.373** | -0.151** | 0.183** | 0.183** | 1       |         |         |    |
| TD        | 3.528 | 0.748 | 0.351** | -0.050   | 0.171** | 0.171** | 0.442** | 1       |         |    |
| RC        | 3.440 | 0.649 | 0.405** | -0.093   | 0.216** | 0.216** | 0.530** | 0.444** | 1       |    |
| AS        | 2.54  | 1.329 | 0.360** | -0.042   | 0.192** | 0.192** | 0.346** | 0.308** | 0.259** | 1  |

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

Table 2 shows that salary is positively correlated to employee motivation. It implies that increase in salary leads to increase in employee motivation. The result also reveals that bonus and commission are positively correlated to employee motivation. It implies that better the bonus and commission, higher would be the employee motivation. Moreover, training and development program are positively correlated to employee motivation indicating that better the training and development programs, higher would be the employee motivation. Furthermore, recognition is positively correlated to employee motivation indicating that better recognition in the bank leads to increase in employee motivation. Similarly, the result also shows that autonomy support is positively correlated to employee motivation. It indicates that increase in autonomy support leads to increase in employee motivation.

The result also shows that salary is negatively correlated to employee turnover intention. It implies that increase in salary leads to decrease in employee turnover intention. The result also reveals that bonus and commission are negatively correlated to employee turnover intention. It implies that better the bonus and commission, lower would be the employee turnover intention. Moreover, training and development program are negatively correlated to employee turnover intention indicating that better the training and development programs, lower would be the employee turnover intention. Furthermore, recognition is negatively correlated to employee turnover intention indicating that better recognition in the bank leads to decrease in employee turnover intention. Similarly, the result also shows that autonomy support is negatively correlated to employee turnover intention. It indicates that increase in autonomy support leads to decrease in employee turnover intention.

## Regression analysis

Having indicated the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 3. More specifically, it presents the regression results of salary, bonus and commission, promotion, training and development, recognition and autonomy support on employee motivation in Nepalese commercial banks.

**Table 3:** Estimated regression results of salary, bonus and commission, promotion, training and development, recognition and autonomy support on employee motivation

The results are based on 200 observations using linear regression model. The model is  $EM = \beta_0 + \beta_1 SA + \beta_2 BC + \beta_3 PR + \beta_4 TD + \beta_5 RC + \beta_6 AS + e$ , where the dependent variable is EM (Employee motivation). The independent variables are SA (Salary), BC (Bonus and commission), PR (Promotion), TR (Training and development), RC (Recognition) and AS (Autonomy support).

| Model | Inter-cept          | Regression coefficients of |                     |                    |                    |                    |                    | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F- value |
|-------|---------------------|----------------------------|---------------------|--------------------|--------------------|--------------------|--------------------|------------------------------------|-------|----------|
|       |                     | SA                         | BC                  | PR                 | TD                 | RC                 | AS                 |                                    |       |          |
| 1     | 2.200<br>(11.225)** | 0.351<br>(6.479)**         |                     |                    |                    |                    |                    | 0.171                              | 0.590 | 41.975   |
| 2     | 0.570<br>(3.525)*   |                            | 0.839<br>(18.016)*  |                    |                    |                    |                    | 0.622                              | 0.399 | 324.57   |
| 3     | 1.894<br>(9.911)**  |                            |                     | 0.454<br>(8.272)** |                    |                    |                    | 0.254                              | 0.560 | 68.432   |
| 4     | 1.774<br>(8.242)**  |                            |                     |                    | 0.469<br>(7.877)** |                    |                    | 0.236                              | 0.567 | 62.046   |
| 5     | 1.779<br>(9.227)**  |                            |                     |                    |                    | 0.476<br>(8.802)** |                    | 0.279                              | 0.550 | 77.482   |
| 6     | 1.938<br>(10.010)** |                            |                     |                    |                    |                    | 0.425<br>(7.928)** | 0.238                              | 0.566 | 62.855   |
| 7     | 0.327<br>(2.002)*   | 0.110<br>(3.099)**         | 0.742<br>(18.675)** | 0.247<br>(6.436)** |                    |                    |                    | 0.742                              | 0.329 | 190.352  |
| 8     | 0.528<br>(3.205)**  | 0.073<br>(2.072)*          | 0.731<br>(19.095)** | 0.168<br>(4.056)** | 0.178<br>(4.102)** |                    |                    | 0.761                              | 0.317 | 158.558  |
| 9     | 0.552<br>(3.381)**  | 0.059<br>(1.651)           | 0.719<br>(18.801)** | 0.119<br>(2.586)*  | 0.154<br>(3.485)** | 0.106<br>(2.317)*  |                    | 0.766                              | 0.313 | 130.778  |
| 10    | 0.596<br>(3.707)**  | 0.031<br>(0.666)           | 0.693<br>(17.964)** | 0.104<br>(2.279)*  | 0.143<br>(3.372)** | 0.128<br>(2.802)** | 0.133<br>(2.893)** | 0.775                              | 0.307 | 114.536  |

**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. Employee motivation is the dependent variable.

The regression results show that the beta coefficients for salary are positive with employee motivation. It indicates that salary has a positive impact on employee motivation. This finding is similar to the findings of Parker and Kohlmeyer (2005). Likewise, the beta coefficients for bonus and commission are positive with employee motivation. It indicates that bonus and commission have a positive impact on employee motivation. This finding is consistent with the findings of Ichniowski (1997). Moreover, the beta coefficients for promotion are positive with employee motivation. It indicates that promotion has a positive impact on employee motivation. This finding is similar to the findings of Kreitner (2004). Furthermore, the beta coefficients for training and development are positive with employee motivation. It indicates that training and development have a positive impact on employee motivation. This finding is consistent with the findings of Elnaga and Imran (2013). In addition, the beta coefficients for recognition are positive with employee motivation. It indicates that recognition has a positive impact on employee motivation. This finding is similar to the findings of Kathina and Bula (2021). Moreover, the beta coefficients for autonomy support are positive with employee motivation. It indicates autonomy support has a positive impact on employee motivation. This finding is similar to the findings of Deci et al. (2001).

Table 4 presents the regression results of salary, bonus and commission, promotion, training and development, recognition, autonomy support and employee motivation on turnover intention in Nepalese commercial banks.



**Table 4:** Estimated regression results of salary, bonus and commission, promotion, training and development, recognition, autonomy support, employee motivation on turnover intention

The results are based on 200 observations using linear regression model. The model is  $TI = \beta_0 + \beta_1 SA + \beta_2 BC + \beta_3 PR + \beta_4 TD + \beta_5 RC + \beta_6 AS + \beta_7 EM + e$ , where the dependent variable is TI (Turnover intention). The independent variables are SA (Salary), BC (Bonus and commission), PR (Promotion), TR (Training and development), RC (Recognition), AS (Autonomy support) and EM (Employee motivation)

| Model | Intercept          | Regression coefficients of |                     |                     |                   |                   |                    |                   | Adj. R_bar <sup>2</sup> | SEE   | F- value |
|-------|--------------------|----------------------------|---------------------|---------------------|-------------------|-------------------|--------------------|-------------------|-------------------------|-------|----------|
|       |                    | SA                         | BC                  | PR                  | TD                | RC                | AS                 | EM                |                         |       |          |
| 1     | 3.281<br>(7.471)** | -0.208<br>(1.715)          |                     |                     |                   |                   |                    |                   | 0.010                   | 1.323 | 2.941    |
| 2     | 1.935<br>(3.616)*  |                            | -0.178<br>(1.158)   |                     |                   |                   |                    |                   | 0.002                   | 1.328 | 1.340    |
| 3     | 3.727<br>(8.350)** |                            |                     | -0.347<br>(2.707)** |                   |                   |                    |                   | 0.131                   | 1.309 | 7.328    |
| 4     | 3.190<br>(6.335)** |                            |                     |                     | -0.181<br>(1.304) |                   |                    |                   | 0.004                   | 1.327 | 1.700    |
| 5     | 3.346<br>(7.232)** |                            |                     |                     |                   | -0.230<br>(1.768) |                    |                   | 0.011                   | 1.322 | 3.216    |
| 6     | 2.935<br>(6.466)** |                            |                     |                     |                   |                   | -0.111<br>(0.879)  |                   | 0.001                   | 1.330 | 0.773    |
| 7     | 2.663<br>(5.199)** |                            |                     |                     |                   |                   |                    | -0.033<br>(0.228) | 0.005                   | 1.335 | 0.052    |
| 8     | 2.962<br>(4.384)** | -0.094<br>(0.643)          | -0.293<br>(1.873)   | -0.391<br>(2.289)*  | -0.068<br>(0.379) |                   |                    |                   | 0.035                   | 1.309 | 2.820    |
| 9     | 2.969<br>(4.374)** | -0.089<br>(0.602)          | -0.297<br>(1.873)** | -0.376<br>(1.954)   | -0.075<br>(0.406) | -0.031<br>(0.164) |                    |                   | 0.030                   | 1.312 | 2.250    |
| 10    | 2.938<br>(4.296)** | -0.146<br>(0.735)          | -0.282<br>(1.729)   | -0.386<br>(1.987)*  | -0.068<br>(0.367) | -0.018<br>(0.092) | -0.0843<br>(0.431) |                   | 0.026                   | 1.335 | 1.898    |
| 11    | 2.834<br>(3.980)** | -0.142<br>(0.710)          | -0.384<br>(1.422)   | -0.375<br>(1.896)   | -0.094<br>(0.489) | -0.006<br>(0.028) | -0.087<br>(0.433)  | -0.128<br>(0.415) | 0.023                   | 1.317 | 1.669    |

**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. Turnover intention is the dependent variable.

The regression results show that the beta coefficients for salary are negative with turnover intention. It indicates that salary has a negative impact on turnover intention. This finding is similar to the findings of Robbins (2003). Likewise, the beta coefficients for bonus and commission are negative with turnover intention. It indicates that bonus and commission have a negative impact on turnover intention. This finding is consistent with the findings of Flynn (1999). Moreover, the beta coefficients for promotion are negative with turnover intention. It indicates that promotion has a negative impact on turnover intention. This finding is similar to the findings of Pousa & Mathieu (2010). Furthermore, the beta coefficients for training and development are negative with turnover intention. It indicates that training and development have a negative impact on turnover intention. This finding is consistent with the findings of Bapna et al. (2013). In addition, the beta coefficients for recognition are negative with turnover intention. It indicates that

recognition has a negative impact on turnover intention. This finding is similar to the findings of Zakaria et al. (2011). Moreover, the beta coefficients for autonomy support are negative with turnover intention. It indicates autonomy support has a negative impact on turnover intention. This finding is similar to the findings of Nie et al. (2015).

## 1. Summary and conclusion

In modern corporate world, employees are regarded as asset and vital resource for the business in any organization. From designing to executing strategies and rules, employees are the fundamental ingredient. The success of a business is primarily affected by the conduct of the employees in the firm regardless of whether they are dealing with the clients directly or not. Businesses that certainly understand the effect of their employees' performance can influence employee productivity and output. Properly governing employee performance helps an organization increase profits and continually meet set goals. One way of managing employees appropriately is by use of rewards. There is need to have motivated employees in both private and public institutions due to the increasing demands of stakeholders, limited organizational resources, globalization, and the rapidly changing technology.

This study attempts to examine the relationship between reward, employee motivation and turnover intention in Nepalese commercial banks. The study is based on primary data collected from 27 commercial banks with 200 respondents.

The study showed that salary, bonus and commission, promotion, training and development, recognition and autonomy support have positive impact on employee motivation. Moreover, salary, bonus and commission, promotion, training and development, recognition and autonomy support have negative impact on turnover intention in Nepalese commercial banks. The study concluded that better reward practices in the organization leads to increase in employee motivation and decrease in turnover intention. The study also concluded that bonus and commission followed by recognition is the most influencing factor that determines the employee motivation in Nepalese commercial banks.

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## Abstract

*This study examines the impact of effective succession planning practices on employee retention in the context of Nepalese commercial banks. Employee retention is the dependent variable. Likewise, the selected independent variables are talent management, career development programs, reward system, supervisor support, training and development and work environment. The primary source of data is used to assess the opinions of the employees regarding succession planning on employee retention in Nepalese commercial banks. The study is based on primary data with 166 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 different factors on succession planning on employee retention in the context of Nepalese commercial banks.*

*The study showed that talent management has positive impact on employee retention. It implies that better management of talented employees leads to increase in employee retention. The result also revealed that career development program has positive impact on employee retention. It implies that better career development programs in the organization leads to increase in employee retention. Moreover, reward system has positive impact on employee retention. It implies that attractive rewards lead to increase in employee retention. Furthermore, training and development have positive impact on employee retention indicating that better training and development programs in the banks leads to increase in employee retention. Similarly, the result also showed that supervisor support has positive impact on employee retention. It indicates that higher the level of supervisor support, higher would be the employee retention. Moreover, work environment has positive impact on employee retention. It implies that better the work environment, higher would be the employee retention.*

**Keywords:** Talent management, career development programs, reward system, supervisor support, work environment and employee retention.



# 1. Introduction

Succession planning is a critical perspective for any current or imminent organization that needs to remain competitive. Employees are exceptionally essential to an organization as they can either cause its success or failure (Biggs, 2004). Retaining talented employees will not only boost the competitiveness of companies, but will also reduce the cost of companies alleviating costly recruiting-cycles. Organizations need individuals who perform well and choose to remain as their employees. The key to employee retention is the fit between the objective conditions of the job and the worker's expectations. Jindal and Shaikh (2021) stated that succession planning reduces the time duration and expenditure of externally personal enlisting and hiring. Succession planning enhances employee's commitment, motivation and reduces the consequence of layoff nevertheless much extensively it develops the various group of talented and competent human assets inside the firm. Today, retention of top talents in organizations continue to remain a prime concern for most organizations. Succession planning is a way of determining important levels of employees and establishing a backup plan for their successful replacements. There is always a fear in the minds of corporate management regarding lack of having future leaders and replacements for all level of employees. This can easily bring gap in continuity of business which in turn brings a high need of having a structured succession plan implemented in every organization (Groves, 2007). Many organizations these days are focused to select the replacements for all the employee levels and positions at the time of crises, only when they think that there is no option left and they are at the verge of downfall than they start to feel the need of it, which is reactive approach instead of this they must have a Succession planning process within their organizations (Huang et al., 2011). Organizations may be able to reduce employee turnover at the start of an employee's career by ensuring a good fit between individual and organizational culture at the recruitment stage through more strict processes, such as focusing on the quality of their qualifications. Likewise, extensive formal training can lower the percentage of employees leaving each year. Moreover, organizations that promote from within and actively prepare their employees for higher positions could improve employee turnover rates which organizations face annually (Ahsan, 2018).

Tetteh (2015) examined the relationship between succession planning, employee retention and organizational effectiveness among some selected organizations in Ghana. The study concluded that succession planning has a significant effect on employee retention and organizational effectiveness. The result also provided empirical evidence that career development program moderates the relationship between succession planning and employee retention. Avanesh (2012) examined succession planning and its impact on organizational performance in the IT sector. The study found that the relationship between succession planning and organizational performance is found to be positive. Methembu (2012) explored the impact of succession planning on employee retention. The findings of the study revealed that employees were positive about the process used for succession planning, as well as the criteria the organization uses for selection to the succession planning program. Moreover, Gulzar and Durrani (2014) examined the impact of succession planning on employee engagement and retention in telecommunication sector in Rawalpindi, Pakistan. The study concluded if implemented effectively, succession planning can bring high level of employee engagement in the organization, which is also a key business driver for any firm. In addition, Isfahani (2014) examined the effects of talent management and succession planning on employee retention. The results showed that there is a significant relationship between talent management, employee retention and organizational trust. Every organization puts an effort to retain those employees who have skills and competencies and have the required potential and talent which can add value to organization. Succession planning is that one key area which most of the companies are required to focus



on (Hiltrop, 1999). Succession management is considered as a structured process for both planned roles and development of leadership positions in order to ensure required backup for leadership positions are available and right potential will be provided when the positions are to be opened. Utilization of resources potential and existing talent is one more benefit of succession planning process. Proper management and effective planning can help in the development process and by evaluating the specific skills it can be helpful in developing the effective leadership and it will ultimately contribute in the organization development as well in the longer run (Zhang and Rajagopalan, 2010).

El Badawy et al. (2016) examined the relationship between succession planning, job engagement and job satisfaction. The results showed that there are positive correlations between succession planning, job engagement and job satisfaction. Similarly, Ahsan (2018) examined impact of effective recruitment and selection along with succession planning towards leadership development, employee retention and talent management towards organization effectiveness in Pakistan. The study revealed that effective recruitment/selection positively influence employee retention, leadership development and talent management. The result also showed that succession planning also effectively mediates the association between them. Similarly, providing suitable leadership development opportunities is an essential part of any succession planning program and help in the organization growth. Furthermore, Baharin and Hanafi (2018) stated that organization should focus on the implementation of talent management since it can help to attain strategic goals such as building a high-performance learning environment and increase value to the organization. Ali and Mehreen (2018) revealed that succession planning provides job security and creates positive career attitude which in turn mitigate the turnover intentions among banks employees. Similarly, Dhurup (2019) concluded that organizations that do not have succession plans or do not appropriately implement such plans will fail to retain their valued employees. The study revealed that employees view such organizations as lacking recognition and may show greater propensity to leave the organization.

In the context of Nepal, Rawal et al. (2022) examined the impact of workplace environment on employee performance in Nepalese insurance companies. The result showed that supervisor support has positive impact on employee performance. It indicates that increase in supervisory support leads to increase in employee performance in Nepalese insurance companies. Likewise, flexible working environment has positive impact on employee performance in insurance companies. Poudel (2016) examined the challenging factors of employee retention in Nepalese organizations. The result showed that review of benefit package significantly decreases employee short-term retention. The study showed poor compensation and benefits, negative work environment, frustration, constant friction with their superiors or other members, unfair treatment, lack of recognition, challenging job, job insecurity etc. are the main causes of quitting job by employees. Kunwar et al. (2022) revealed that salary, flexible working hour, working environment, performance appraisal, location, training and development have positive impact on employee retention in insurance companies. The study concluded that better salary benefits and performance appraisal programs leads to higher employee retention. Similarly, Ghimire (2017) examined employee retention factors in Nepalese insurance companies. The study revealed that employee retention is a complex phenomenon that requires strategic orientation towards retention factors that covers salary and benefits, career opportunities, work life.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the effective succession planning practices and its impact on employee 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 determine the impact of effective succession planning practices on employee retention of Nepalese commercial banks. More specifically, it examines the impact of talent management, career development programs, reward system, supervisor support, training and development and work environment on employee retention in the context of Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on the primary data. The data were gathered from 166 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on talent management, career development programs, reward system, supervisor support, training and development and work environment. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that employee retention depends on talent management, career development programs, reward system, supervisor support, training and development and work environment. Therefore, the model takes the following form:

$$ER = \beta_0 + \beta_1 TM + \beta_2 CD + \beta_3 RS + \beta_4 TD + \beta_5 SS + \beta_6 WE + e$$

Where,

ER = Employee retention

TM = Talent management

CD = Career development program

RS = Reward system

TD = Training and development

SS = Supervisor support

WE = Work environment

Talent 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 are 5 items and sample items include "The bank has a clear talent management strategy", "Employees are allocated to different talent pools" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.779$ ).

Career development program was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The bank offers employees continuous support to improve their skills", "I receive appropriate training and development program, as to my need" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.883$ ).

Reward system was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include

“There are incentives for good performance”, “There are different types of rewards offered” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.850$ ).

Training and development were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “My career path is more in shape due to my participation in training program”, “I believe my promotion is a result of the induction of the training program” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.733$ ).

Supervisor support was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “My supervisors acknowledge good performance”, “My problems are heard by my seniors” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.789$ ).

Work environment was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “I easily coordinate with other department staff”, “My organization is transparent about their internal promotion strategy” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.756$ ).

Employee retention was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Talented employees are valued in the organization”, “The bank gives all its employees bonuses and incentives based on employee performance” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.815$ ).

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

## **Talent management**

The differential value created by talented employees and their contribution to organizations in the hypercompetitive and complex global economy has made talent management a strategic priority for organizations. Talent management has been advocated as an important strategy to retain talented employees (Narayanan et al., 2019). Moore (2002) identified that lack of job dissatisfaction, low levels of empowerment, and low levels of talent management and support may lead to increased turnover. Hong (2012) found that HR policies to properly manage the talents play a strategic role in employee retention through stimulating skilled labor. According to Kontoghiorghes (2016), effective talent management recommends talented employees begin to see themselves as part of the organization, add value to the organization and remain glued to it. Furthermore, Alias et al. (2014) examined the mediating effect of employee engagement on the relationship between talent management practices and employee retention in the Information and Technology (IT) organizations in Malaysia. The study found a positive relationship between talent management and employee retention. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship of talent management and employee retention

## Supervisor support

Rhoades and Eisenberger (2002) stated supervisor support refers to the supervisor's actions in supporting their workforce to show skills, learning and attitudes obtain from the training program. The belief of an employee in a firm is greatly influenced by its connection to its supervisor (Eisenberger et al., 1990). Greenhaus (1993) stated that employees who have support from a supervisor are less inclined to depart from the company and are much more involved by having a better association with the supervisor. Fatima (2011) stated support from a supervisor is crucial to employee retention. Rothwell (2010) stated that effective succession planning practices create a positive work relationship between supervisors and employees. The study also showed a positive association between supervisory support and employee retention. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship of supervisor support and employee retention.

## Work environment

The working environment is a key influencer that explains the changes in the level of employee retention (Kossivi et al., 2016). According to Nyanjom (2013), changing the toxic environment into sound and better working environment enhances employees' happiness and increases the retention rate. A favorable working environment is believed to make employees experience good about coming to work and give the essential motivation to endure them throughout the day. Hytter (2008) found a positive relationship between better working environment and employee retention. Employees are happy to work in those companies which offer a favorable working environment where they know that they are creating a difference and where many of the employees inside the organization are competent and are working together to drive the business forward (Msengeti and Obwogi, 2015). Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of work environment and employee retention.

## Reward system

Rewards for employment satisfaction are extremely valuable because it meets both the fundamental demands and assists to achieve the higher-level objectives. Employee performance and their intention to stay on a job can influence by the rewards system of a firm (Bamberger and Meshoulam, 2000). Iqbal et al. (2017) assessed the effects of job organizational culture, benefits, salary on job satisfaction and employee retention. The study found that organizational culture, benefits and salary have positive effect on job satisfaction and ultimately results in higher retention of the employees. Mendis (2017) stated that rewards have a sustainable effect on the workforce and it will proceed to vindicate workers thinking that they are appreciated, hence resulting in employees wanting to stay. Both the monetary and none monetary rewards are vital for increasing the retention of employees (Pillay, 2009). Succession planning rewards employees in the form of promotion to the future vacant position. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship of reward system and employee retention.

## Career development program

Herr (2001) asserted that career opportunities make stronger managerial support for the growth and success of the workforce. The development of a career is essential for the employee and the organization (Sandhya and Kumar, 2011). Organizations require skilled employees to maintain a sustainable competitive edge and employee need career opportunities to advance and improve their skills (Prince, 2005). James and Mathew (2012) stated that succession planning is a crucial predictor of career achievement that reasonably improves the employee's job behavior towards learning, mentoring, advancement and decreases employee's wish to leave. Succession planning authorizes the employees to concentrate effectively and efficiently on their career paths through opportunities to learn (Heiden, 2007). This results in retention of talented employees. Sheraz et al. (2019) showed a positive association between employee retention and better programs for the employees regarding career development. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of career development program and employee retention.

## Training and development

Training and development are the systematic approach to develop and enhance employee skills, abilities and knowledge for the purpose of increasing organizational effectiveness. Kyndt et al. (2011) revealed that training has a potential to change the turnover thoughts and is an important factor that helps in originating the intentions of turnover. Training and development programs are crucial for the succession of an organization because these programs assist with retaining the knowledge of long-time employees and help to develop an organization that has a culture built to learn (McNabb et al., 2006). Analyzing the training needs is very important for the design of effective training and the companies should establish training programs to equip the workers and managers with the sufficient skills in order to make them more effective in working with them and turning them into a diverse team (Fletcher et al., 2018). Atif et al. (2011) found a positive relationship between employee retention and training and development. Based on it, this study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship of training and development and employee retention.

# 3. Results and discussion

## Correlation analysis

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

**Table 1:** Kendall's correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 166 observations. The dependent variable is ER (Employee retention). The independent variables are TM (Talent management), CD (Career development program), RS (Reward system), TD (Training and development), SS (Supervisor support) and WE (Work environment).

| Variables | Mean  | SD    | ER      | TM      | CD      | RS      | TD      | SS      | WE |
|-----------|-------|-------|---------|---------|---------|---------|---------|---------|----|
| ER        | 3.898 | 0.503 | 1       |         |         |         |         |         |    |
| TM        | 4.005 | 0.526 | 0.238** | 1       |         |         |         |         |    |
| CD        | 3.935 | 0.444 | 0.220** | 0.265** | 1       |         |         |         |    |
| RS        | 4.033 | 0.480 | 0.149*  | 0.310** | 0.302** | 1       |         |         |    |
| TD        | 3.875 | 0.572 | 0.118*  | 0.208** | 0.173** | 0.149*  | 1       |         |    |
| SS        | 3.871 | 0.627 | 0.062   | 0.117*  | 0.152*  | 0.237** | 0.277** | 1       |    |
| WE        | 3.799 | 0.489 | 0.046   | 0.240** | 0.239** | 0.216** | 0.202** | 0.286** | 1  |

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

The correlation matrix indicates that talent management is positively correlated to employee retention. It implies that better management of talented employees leads to increase in employee retention. The result also reveals that career development program is positively correlated to employee retention. It implies that better career development programs in the organization leads to increase in employee retention. Moreover, reward system is positively correlated to employee retention. It implies that attractive rewards lead to increase in employee retention. Furthermore, training and development are positively correlated to employee retention indicating that better training and development programs in the banks leads to increase in employee retention. Similarly, the result also shows that supervisor support is positively correlated to employee retention. It indicates that higher the level of supervisor support, higher would be the employee retention. Moreover, work environment is positively correlated to employee retention. It implies that better the work environment, higher would be the employee 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 talent management, career development programs, reward system, supervisor support, training and development and work environment on employee retention in Nepalese commercial banks.

**Table 2:** Estimated regression results of talent management, career development programs, reward system, supervisor support, training and development and work environment on employee retention

The results are based on 166 observations using linear regression model. The model  $ER = \beta_0 + \beta_1 TM + \beta_2 CD + \beta_3 RS + \beta_4 TD + \beta_5 SS + \beta_6 WE + e$ , where the dependent variable is ER (Employee retention). The independent variables are TM (Talent management), CD (Career development program), RS (Reward system), TD (Training and development), SS (Supervisor support) and WE (Work environment).

| Model | Inter-cept          | Regression coefficients of |                    |                    |                    |                    |                    | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------------|-------|---------|
|       |                     | TM                         | CD                 | RS                 | TD                 | SS                 | WE                 |                         |       |         |
| 1     | 3.589<br>(12.056)** | 0.054<br>(0.711)           |                    |                    |                    |                    |                    | 0.003                   | 0.489 | 0.506   |
| 2     | 2.386<br>(8.805)**  |                            | 0.353<br>(5.260)** |                    |                    |                    |                    | 0.139                   | 0.453 | 27.670  |
| 3     | 2.289<br>(7.172)**  |                            |                    | 0.384<br>(4.762)** |                    |                    |                    | 0.116                   | 0.459 | 22.679  |
| 4     | 2.616<br>(8.461)**  |                            |                    |                    | 0.294<br>(3.857)** |                    |                    | 0.078                   | 0.469 | 14.875  |
| 5     | 2.746<br>(11.082)** |                            |                    |                    |                    | 0.272<br>(4.297)** |                    | 0.096                   | 0.464 | 18.461  |
| 6     | 2.646<br>(11.991)** |                            |                    |                    |                    |                    | 0.298<br>(5.294)** | 0.141                   | 0.453 | 28.029  |
| 7     | 2.600<br>(7.825)**  | 0.083<br>(1.113)           | 0.380<br>(5.325)** |                    |                    |                    |                    | 0.140                   | 0.453 | 14.475  |
| 8     | 2.128<br>(5.806)**  | 0.122<br>(1.637)           | 0.282<br>(3.607)** | 0.259<br>(2.809)** |                    |                    |                    | 0.175                   | 0.443 | 12.687  |
| 9     | 1.998<br>(5.117)**  | 0.123<br>(1.657)           | 0.251<br>(2.965)** | 0.239<br>(2.532)*  | 0.084<br>(0.968)   |                    |                    | 0.175                   | 0.443 | 9.746   |
| 10    | 1.685<br>(4.209)**  | 0.133<br>(1.821)           | 0.212<br>(2.522)*  | 0.205<br>(2.200)*  | 0.078<br>(0.913)   | 0.171<br>(2.695)*  |                    | 0.206                   | 0.355 | 9.552   |
| 11    | 1.537<br>(3.916)**  | 0.138<br>(1.939)*          | 0.214<br>(2.614)** | 0.185<br>(2.034)*  | 0.022<br>(0.258)   | 0.102<br>(1.553)   | 0.189<br>(3.148)** | 0.248                   | 0.423 | 10.055  |

**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 retention is the dependent variable.

The regression results show that the beta coefficients for talent management are positive with employee retention. It indicates that talent management has a positive impact on employee retention. This finding is similar to the findings of Kontoghiorghe (2016). Likewise, the beta coefficients for career development program are positive with employee retention. It indicates that career development program has a positive impact on employee retention. This finding is consistent with the findings of Sandhya and Kumar (2011). Moreover, the beta coefficients for reward system are positive with employee retention. It indicates that reward system has a positive impact on employee retention. This finding is similar to the findings of Mendis (2017). Furthermore, the beta coefficients for training and development are positive with employee retention. It indicates that training and development have a positive impact on employee retention. This finding is consistent with the findings of Kyndt et al. (2011). In addition, the beta coefficients for supervisor



support are positive with employee retention. It indicates that supervisor support has a positive impact on employee retention. This finding is similar to the findings of Greenhaus (1993). Similarly, the beta coefficients for work environment are positive with employee retention. It indicates that better working environment has a positive impact on employee retention. This finding is similar with the findings of Kossivi et al. (2016).

## 4. Summary and conclusion

A succession plan focuses on identifying potential leaders and high performers, helping them develop so they can advance within their organization. Succession planning is vital because it is more cost-effective to develop current employees for key positions rather than hire new people as organization grows. Giving employees a clear path forward in their careers through a succession plan can also boost engagement and retention.

This study attempts to examine the impact of effective succession planning on employee retention in the context of Nepalese commercial banks. The study is based on primary data with 166 observations.

The study showed that talent management, career development program, reward system, training and development, supervisor support and work environment have positive impact on employee retention in Nepalese commercial banks. The study concluded that better succession planning practices directed towards the employees leads to higher level of retention of the employees towards the organization. The study also concluded that work environment followed by career development program are the most influencing factors that explain the changes in employee retention in Nepalese commercial banks.

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## Abstract

*This study examines the impact of leadership styles on financial performance of Nepalese commercial banks. Return on assets and return on equity are the dependent variables. Likewise, the selected independent variables are transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership. The primary source of data is used to assess the opinions of the respondents regarding leadership styles adopted in the banks. The study is based on primary and secondary data of 25 Nepalese commercial banks with 156 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 different leadership styles on the performance of Nepalese commercial banks.*

*The study showed transformational leadership has a positive impact on return on assets and return on equity. It indicates that increase in transformational leadership in the organization leads to increase in return on assets and return on equity. Similarly, transactional leadership has a positive impact on return on assets and return on equity. This indicates that increase in transactional leadership in the organization leads to increase in return on assets and return on equity. In addition, laissez-faire leadership has a positive impact on return on assets and return on equity. It reveals that increase in laissez-faire leadership leads to increase in return on assets and return on equity. Furthermore, supportive leadership has a positive impact on return on assets and return on equity. It implies that increase in supportive behavior from the manager in the organization leads to increase in return on assets and return on equity. Likewise, participative leadership has a positive impact on return on assets and return on equity. It indicates that increase in participative leadership leads to increase in return on assets and return on equity of Nepalese commercial banks.*

**Key words:** Transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership.

# 1. Introduction

In business organizations, investors and businessmen desire and endeavor to ensure that their organizations perform well to earn more profit, grow fast and achieve competitive edge in the industry. For organizations to perform well, apart from tangible and intangible resources, effective and dynamic leadership is a pre requisite. Leadership style of the leader of an organization has a strong impact on the performance of the organization (Hurduzeu, 2015). Growth of an organization and efficiency in operation is achieved through best practices adopted and pursued by organizations under the guidance and supervision of a dynamic and transformational leader. Hence, a strong and dynamic and transformational leader in today's competitive environment plays a vital role in organizational performance (Chen and Silverthorne, 2005). Today, business environment is full of competition and organizations without a competitive advantage and strong leadership will lag behind in the race. Organizations face multiple challenges and the present competitive environment needs prudent and well thought out strategies for improvement in operational performance and achieving competitive advantage (Vargas, 2015). Leadership style of management is a pre-requisite for effective accomplishment in an organization. The leadership styles determine the level of subordinate participation in decision-making and the way an organization is run administratively. Leaders are only key source that drive to improving the performance and modernization of followers (Lievens, 1997). According to Rizzi et al. (2013), leadership is a process by which a person influences others to accomplish an objective and directs the organization in a way that makes it more cohesive and coherent. These are accomplished through the application of leadership attributes, such as beliefs, values, ethics, character, knowledge, and skills. Leadership is the integrated sharing of vision, resources, and value to induce positive change. It is the ability to build up confidence and zeal among people and to create an urge in them to be lead. Wammy and Swammy (2014) defined leadership as a social influence process in which the leader seeks the voluntary participation of subordinates in an effort to reach organization goals. Leadership as a process by which an individual influences the thoughts, attitudes and behaviors of others by taking responsibility for setting direction for the firm, others to see and visualize what lies ahead and figure out how to archive it (Memon, 2014).

The role of leadership in an organization is crucial in terms of creating a vision, mission, determination and establishment of objectives, designing strategies, policies, and methods to achieve the organizational objectives effectively and efficiently along with directing and coordinating the efforts and organizational activities. Top quality leadership is essential to achieve the mission and vision along with coping with the changes occurring in the external environment (Harris et al., 2007). In current time, many companies are facing problems related to unethical practices, high labor turnover, poor financial performance, etc. This may be due to the lack of effective leadership. The main aim of many companies is to accomplish its stated objectives. Hence, there is a need of effective leaders for coordinating and motivating the employees (Grimland et al., 2012). Jeremy and Melinde (2012) considered leadership as the pattern associated with managerial behavior, which is designed to integrate the organizational or personal interest and effects for achieving particular objectives. There is a considerable impact of the leadership styles on organizational performance. The leadership style influences the culture of the organization which, in turn, influences the organizational performance (Klien et al., 2013).

Obiwuru et al. (2011) stated that effective leadership provides an appropriate response to environmental factors of time, culture, wants and needs and their harmonization to ensure smooth operation of these factors for maximizing profit and growth of an organization. The combined effect of these factors and outcome is the improved performance of the organization. Kehinde et al. (2012) explained that an excel-

lent leader not only inspires subordinates' potential to enhance efficiency but also meets their requirements in the process of achieving organizational goals. Leadership is a strategy to motivate employees to tap their full potentials for the development and growth of the organization (Fry, 2003). A transformational leader uses values and principles for motivating subordinates to achieve expected level of performance. This style encourages critical thinking and thinking out of the box solution for problems which is achieved through intellectual stimulation of followers. This results in enhanced and improved level of performance, satisfaction level and commitment of employees towards achievement of the goals of their organization (Andriani et al, 2018). Transformational leaders provide vision and motivate employees for difficult goals and objectives resulting into higher productivity and profitability, transactional leadership on the other hands attaches rewards for achievements of objectives and links performance with value rewards. It also ensures that the employees are provided with the required resources (Naoum, 2001).

Efficient utilization of the available resources by members of an organization depends upon the understanding and style of the leader which has a direct impact on the performance of the organization. The extent to which members of an organization contribute in harnessing available resources of the organization equally depends on how well the managers (leaders) of the organization understand and adopt appropriate leadership style in performing their roles as managers and leaders. Thus, efficiency in resources mobilization, allocation, utilization and enhancement of organizational performance depends, to a great extent, on leadership style (Khan and Adnan, 2014). Katsaros et al. (2020) examined the impact of leadership on firm financial performance and the mediating role of employees' readiness to change. The results showed that the three leadership styles (i.e., authoritarian, democratic, and laissez-faire) are related to readiness to change and readiness to change is also positively related to organizational performance. The study concluded that leadership style has a positive impact on financial performance. The idealized and behavioral charisma of the transformational leaders motivates the followers to identify with the leader (Jyoti and Bhau, 2015). The personalized relationship developed by a transformational leader develops an environment in which the employees feel happy and hence, their overall performance is improved. Sofi and Devanadhen (2015) stated that the transformational leadership has a significant impact on the performance of the organization. Ojokuku et al. (2012) suggested that the charismatic leadership bears a negative relationship with the organizational leadership. It does not motivate and induce the employees enough to retrieve the expected performances out of them. Elenkov (2002) indicated that the democratic leadership has a positive impact on organizational performance. The democratic leadership allows the employees to make decisions along with sharing them with the group and the manager. In this type of leadership style, praises and criticism are given objectively and a sense of responsibility is also developed among the employees.

In the context of Nepal, Shrestha (2012) investigated the relationship of leadership styles and employees' commitment with organizational change and organizational performance. The study found that transformational leadership style is the stronger predictor of improved organizational performance than transactional leadership style. The study also found that there is a significant relationship between leadership styles, employee's commitment to change, and organizational performance. Bista (2016) found that job security, pay, promotion potentials, relationship with co-workers and supervisors are the most influencing factors that determines the employee job satisfaction. Moreover, Thagunna (2020) revealed that organizational culture, physical work environment, work-life balance, supervisor support and workplace incentives have positive impact on employees' performance in Nepalese commercial banks.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of leadership style on the financial performance of 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 this study is to examine the impact of leadership styles on the financial performance of Nepalese commercial banks. More specifically, it examines the impact of transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership on return on assets and return on equity in the context of Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on the primary data. The data were gathered from 156 respondents through questionnaire. The study employed convenience sampling method. The respondents' views were collected on transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that return on assets and return on equity depends on transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership. Therefore, the model takes the following form:

$$ROA = \beta_0 + \beta_1 TFL_{it} + \beta_2 TSL_{it} + \beta_3 LFL_{it} + \beta_4 SL_{it} + \beta_5 PL_{it} + e_{it}$$

$$ROE = \beta_0 + \beta_1 TFL_{it} + \beta_2 TSL_{it} + \beta_3 LFL_{it} + \beta_4 SL_{it} + \beta_5 PL_{it} + e_{it}$$

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.

TFL = Transformational leadership

TSL = Transactional leadership

LFL = Laissez- faire leadership

SL = Supportive leadership

PL = Participative leadership

Transformational leadership 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 motivate my subordinates to improve their productivity", "I create vision to guide my team" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.755$ ).

Transactional leadership 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 monitor employee performance based on established goals and targets", "I do supervise and give direction to my subordinates" and so on. The reliability of the items was measured by computing the Cronbach's alpha ( $\alpha = 0.709$ ).



Laissez-faire leadership 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 create environment where my subordinates can make their own decisions”, “I expect each of my subordinates to solve problems by themselves” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.768$ ).

Supportive leadership 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 make sure my employees have all the tools they require before completion of given task”, “I try to create a positive workplace environment that may improve morale and employee engagement” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.723$ ).

Participative leadership 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 encourage my subordinates to accomplish the given task”, “I motivate my subordinates to bring fresh and innovative ideas” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.798$ ).

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

## **Transformational leadership**

Transformational leadership style is an inspirational way through which one can motivate and use that motivation thinking ability (Avolio et al., 2004). There is a shared belief that leadership can enhance performance of organizations (Rowe et al., 2005). Avolio et al. (1988) found that transformational leadership and performance of teams at organizational level are associated positively. Likewise, Muenjohn and McMurray (2016) showed that transformational leadership promoted creativity in the workplace. The study also found a significant positive relationship between transformational leadership and organizational performance. Moreover, McMurray et al. (2013) stated transformational leadership has a significant positive relationship with firm innovativeness. In addition, Bono and Judge (2003) found transformational leadership has a positive relationship with performance of employees. The result also showed a significant positive relationship between both transformational and transactional leadership styles and organizational performance. Similarly, Raja and Palanichamy (2011) revealed a positive relationship between both transformational and transactional leadership styles and organizational performance from a sample of employees in public and private sector enterprises in India. Likewise, Muterera (2012) revealed that transformational leadership style tends to impact positively on organizational performance. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship of transformational leadership with financial performance.

## **Transactional leadership**

Transactional leadership motivates and influences subordinates by exchanging reward with a particular performance. Longe (2014) revealed that transactional leadership style has a positive impact on the organizational performance. Similarly, Janssen and Yperen (2004) stated that transactional leadership has significant

impact on employee performance and job satisfaction. Moreover, Iscan et al. (2014) revealed that there is a positive relationship between organizational performance and transactional leadership style. According to Elenkov (2002), in Russia, transactional leadership behavior of the managers has a positive effect on the organizational performance and innovation. Furthermore, Burke et al. (2006) revealed that transactional leadership behavior is significantly related to team performance which enhance the performance of the organization. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship of transactional leadership with financial performance.

## **Laissez faire leadership**

Laissez-faire leadership is related to a passive form of management. Laissez-faire leadership is considered a non-leadership technique in which leaders play a passive role. Laissez-faire kind of leadership has a positive impact on subordinates' job satisfaction level (Luthans et al., 2007). According to Skogstad et al. (2007), laissez faire leadership style has a positive relationship with employee performance. Likewise, Chaudhry and Javed (2012) assessed the effects of leadership styles on employee performance. The study revealed that laissez-faire leadership styles are insignificantly positively related to employee performance. Yang (2015) assessed the impact of leadership styles on employees' performance with moderating role of positive psychological capital. The study revealed that laissez-faire leadership has a significant positive impact on employee's performance. Moreover, Koech and Namusonge (2012) revealed that laissez-faire leadership style is significantly correlated to organizational performance. Likewise, Ukaidi (2016) assessed the influence of leadership styles on organizational performance in Nigeria. The study revealed that there is significant positive influence of leadership style (autocratic, laissez faire and democratic) on organizational performance. Sabir and Khan (2011) stated that there is a significant relationship between laissez-faire leadership style and organizational performance. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of laissez-faire leadership with financial performance.

## **Participative leadership**

Participative leadership is defined as leadership that involves employees across levels of the hierarchy in decision-making (Spreitzer, 2007). Participative leaders involve their subordinates in making and implementing decisions. They seek subordinates' input on important decisions and value others points-of-view. Moreover, Mwaisaka et al. (2019) investigated influence of participative and achievement-oriented leadership styles on employee job satisfaction in commercial banks in Kenya. The study revealed that the participative leadership style is positively and significantly related to employee job satisfaction and organizational productivity. Likewise, Iqbal et al. (2015) found that the participative style of leadership has a significant positive effect on employee performance. It leads to the situation in which employee feel power and confidence in doing their job and in making different decisions which results in increased organizational performance. In addition, Igbaekemen (2014) stated that participative leadership styles help to improve performance among employees and the organization. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship of participative leadership with financial performance.

## Supportive leadership

Supportive leadership is the behavior which focuses on the wellbeing of employees and has a deep concern for the needs, preferences and satisfaction of employees. Supportive leaders create conducive working environment to foster respect, trust, cooperation, and emotional support (Deng and Gibson, 2009). Khalid et al. (2012) assessed the role of supportive leadership as a moderator between job stress and job performance. The study revealed that supportive leadership is positively related to job performance and organizational productivity. Hwang et al. (2015) assessed the impact of leadership behaviors on leaders' perceived job performance across cultures. The study revealed that supportive leadership behavior has a positive relationship with the perceived job performance. In addition, Hauff et al. (2022) stated that high-performance work practices, employee well-being, and supportive leadership have positive influence on job satisfaction, engagement, health status and organizational performance. Similarly, Simorangkir et al. (2019) showed that supportive leadership and learning culture have positive effect on job performance. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of supportive leadership with financial performance.

## 3. Results and discussion

### Correlation analysis

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

**Table 1:** Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 156 observations. The dependent variables are return on assets and return on equity. The independent variables are TFL (Transformational leadership), TSL (Transactional leadership), LFL (Laissez-faire leadership), SP (Supportive leadership) and PL (Participative leadership).

| Variables | Mean   | SD    | TFL     | TSL     | LFL     | SL    | PL    | ROA    | ROE |
|-----------|--------|-------|---------|---------|---------|-------|-------|--------|-----|
| TFL       | 3.786  | 0.589 | 1       |         |         |       |       |        |     |
| TSL       | 3.701  | 0.571 | 0.445** | 1       |         |       |       |        |     |
| LFL       | 3.637  | 0.665 | 0.320** | 0.244** | 1       |       |       |        |     |
| SL        | 4.195  | 0.508 | 0.164** | 0.224** | 0.095   | 1     |       |        |     |
| PL        | 3.785  | 0.645 | 0.319** | 0.359** | 0.152** | 0.065 | 1     |        |     |
| ROA       | 1.215  | 0.431 | 0.017   | 0.006   | 0.125*  | 0.092 | 0.055 | 1      |     |
| ROE       | 14.503 | 3.783 | 0.010   | 0.050   | 0.046   | 0.089 | 0.034 | 0.116* | 1   |

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

The study reveals that transformational leadership is positively related to return on assets. It indicates that increase in transformational leadership in the organization leads to increase in return on assets. Similarly, transactional leadership has a positive relationship with return on assets. This indicates that increase in

transactional leadership in the organization leads to increase in return on assets. In addition, laissez-faire leadership has a positive relationship with return on assets. It reveals that increase in laissez-faire leadership leads to increase in return on assets. Furthermore, supportive leadership is positively related to return on assets. It implies that increase in supportive behavior from the manager in the organization leads to increase in return on assets. Likewise, participative leadership has a positive relationship with return on assets. It indicates that increase in participative leadership leads to increase in return on assets of Nepalese commercial banks.

Moreover, transformational leadership is positively related to return on equity. It indicates that increase in transformational leadership in the organization leads to increase in return on equity. Similarly, transactional leadership has a positive relationship with return on equity. This indicates that increase in transactional leadership in the organization leads to increase in return on equity. In addition, laissez-faire leadership has a positive relationship with return on equity. It reveals that increase in laissez-faire leadership leads to increase in return on equity. Furthermore, supportive leadership is positively related to return on equity. It implies that increase in supportive behavior from the manager in the organization leads to increase in return on equity. Likewise, participative leadership has a positive relationship with return on equity. It indicates that increase in participative leadership leads to increase in return on equity of Nepalese commercial banks.

## **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 transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership on return on assets in Nepalese commercial banks.

**Table 2:** Estimated regression results of transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership, and participative leadership on return on assets

The results are based on 156 observations using linear regression model. The model is  $ROA = \beta_0 + \beta_1 TFL + \beta_2 TSL + \beta_3 LFL + \beta_4 SL + \beta_5 PL + e$  where, the dependent variable is ROA (Return on assets). The independent variables are TFL (Transformational leadership), TSL (Transactional leadership), LFL (Laissez-faire leadership), SP (Supportive leadership) and PL (Participative leadership).

| Model | Intercept          | Regression coefficients of |                  |                   |                   |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|--------------------|----------------------------|------------------|-------------------|-------------------|------------------|-------------------------|-------|---------|
|       |                    | TFL                        | TSL              | LFL               | SL                | PL               |                         |       |         |
| 1     | 1.295<br>(5.710)** | 0.054<br>(0.021)           |                  |                   |                   |                  | 0.006                   | 0.432 | 0.506   |
| 2     | 1.383<br>(6.063)** |                            | 0.045<br>(0.744) |                   |                   |                  | 0.003                   | 0.431 | 0.554   |
| 3     | 1.646<br>(8.643)** |                            |                  | 0.119<br>(2.303)* |                   |                  | 0.077                   | 0.425 | 5.305   |
| 4     | 1.507<br>(5.219)** |                            |                  |                   | 0.079<br>(2.020)* |                  | 0.061                   | 0.431 | 4.041   |
| 5     | 1.085<br>(5.239)** |                            |                  |                   |                   | 0.034<br>(0.635) | 0.004                   | 0.432 | 0.403   |
| 6     | 1.371<br>(5.375)** | 0.007<br>(0.101)           | 0.050<br>(0.066) |                   |                   |                  | 0.009                   | 0.433 | 0.280   |
| 7     | 1.577<br>(5.906)** | 0.059<br>(0.781)           | 0.028<br>(0.037) | 0.133<br>(2.300)* |                   |                  | 0.018                   | 0.427 | 1.956   |
| 8     | 1.730<br>(4.976)** | 0.059<br>(0.775)           | 0.016<br>(0.206) | 0.130<br>(2.243)* | 0.049<br>(0.069)  |                  | 0.015                   | 0.428 | 1.581   |
| 9     | 1.618<br>(4.398)** | 0.045<br>(0.059)           | 0.036<br>(0.044) | 0.129<br>(2.220)* | 0.085<br>(2.024)* | 0.056<br>(0.094) | 0.114                   | 0.043 | 9.552   |

**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.

The regression results show that the beta coefficients for transformational leadership are positive with return on assets. It indicates that transformational leadership has a positive impact on return on assets. This finding is similar to the findings of Muenjohn and McMurray (2016). Similarly, the results reveal that the beta coefficients for transactional leadership are positive with return on assets. It indicates that transactional leadership has a positive impact on return on assets. The finding is consistent with the findings of Longe (2014). Likewise, the beta coefficients for laissez-faire leadership are positive with return on assets. This also indicate that laissez-faire leadership has a positive impact on return on assets. This finding is also consistent with the findings of Skogstad et al. (2007). Furthermore, the beta coefficients for supportive leadership are negative with return on assets. It indicates that supportive leadership has a negative impact on return on assets. This finding is consistent with the findings of Mwaisaka et al. (2019). Likewise, the beta coefficients for participative leadership are positive with return on assets. It also indicates that participative leadership has a positive impact on return on assets. This finding is also consistent with the findings of Khalid et al. (2012).

Table 3 shows the estimated regression results of transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership, and participative leadership on return on equity of Nepalese commercial banks.

**Table 3:** Estimated regression results of transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership, and participative leadership on return on equity

The results are based on 156 observations using linear regression model. The model is  $ROE = \beta_0 + \beta_1 TFL + \beta_2 TSL + \beta_3 LFL + \beta_4 SL + \beta_5 PL + e$  where, the dependent variable is ROE (Return on equity). The independent variables are TFL (Transformational leadership), TSL (Transactional leadership), LFL (Laissez-faire leadership), SP (Supportive leadership) and PL (Participative leadership).

| Model | Intercept           | Regression coefficients of |                   |                   |                   |                  | Adj. R_bar <sup>2</sup> | SEE   | F-value |
|-------|---------------------|----------------------------|-------------------|-------------------|-------------------|------------------|-------------------------|-------|---------|
|       |                     | TFL                        | TSL               | LFL               | SL                | PL               |                         |       |         |
| 1     | 13.696<br>(6.886)** | 0.021<br>(0.411)           |                   |                   |                   |                  | 0.005                   | 3.793 | 0.016   |
| 2     | 12.566<br>(6.290)** |                            | 0.052<br>(0.098)  |                   |                   |                  | 0.001                   | 3.783 | 0.096   |
| 3     | 14.072<br>(8.280)** |                            |                   | 0.011<br>(0.025)  |                   |                  | 0.006                   | 3.794 | 0.067   |
| 4     | 16.922<br>(6.677)** |                            |                   |                   | 0.157<br>(2.096)* |                  | 0.091                   | 2.783 | 5.092   |
| 5     | 13.584<br>(7.473)** |                            |                   |                   |                   | 0.024<br>(0.051) | 0.005                   | 3.792 | 0.026   |
| 6     | 12.770<br>(5.714)** | 0.013<br>(0.021)           | 0.0604<br>(0.091) |                   |                   |                  | 0.007                   | 3.795 | 0.050   |
| 7     | 12.790<br>(5.375)** | 0.012<br>(0.019)           | 0.0606<br>(0.090) | 0.001<br>(0.003)  |                   |                  | 0.001                   | 3.808 | 0.033   |
| 8     | 15.348<br>(4.974)** | 0.013<br>(0.019)           | 0.0790<br>(1.108) | 0.003<br>(0.007)  | 0.081<br>(2.285)* | 0.039<br>(0.007) | 0.102                   | 3.812 | 0.053   |
| 9     | 15.270<br>(4.663)** | 0.014<br>(0.021)           | 0.212<br>(2.522)* | 0.205<br>(2.200)* | 0.078<br>(0.913)  |                  | 0.206                   | 0.355 | 9.552   |

**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.

The regression results show that the beta coefficients for transformational leadership are positive with return on equity. It indicates that transformational leadership has a positive impact on return on equity. This finding is similar to the findings of Raja and Palanichamy (2011). Similarly, the results reveal that the beta coefficients for transactional leadership are positive with return on equity. It indicates that transactional leadership has a positive impact on return on equity. The finding is consistent with the findings of Janssen and Yperen (2004). Likewise, the beta coefficients for laissez-faire leadership are positive with return on equity. This also indicate that laissez-faire leadership has a positive impact on return on equity. This finding is also consistent with the findings of Koech and Namusonge (2012). Furthermore, the beta coefficients for supportive leadership are negative with return on equity. It indicates that supportive leadership has a negative impact on return on equity. This finding is consistent with the findings of Igbaekemen (2014). Likewise, the beta coefficients for participative leadership are positive with return on equity. It also indicates that participative leadership has a positive impact on return on equity. This finding is also consistent with the findings of Hauff et al. (2022).

## 4. Summary and conclusion

Leadership in an organization has a strong effect on financial performance. Leadership is the action of leading people in an organization towards achieving goals. A leader sets a clear vision for the organization, motivates employees, guides employees through the work process and builds morale. Leadership in banking industry provides integration for achieving banking objectives. The bank can achieve its organizational objectives through efficient leadership. Thus, leadership play vital role in banking effectiveness. In today's competitive world, banking sector can become successful only through effective leadership.

This study attempts to examine the impact of leadership style on financial performance commercial banks. The study is based on primary and secondary data of 25 Nepalese commercial banks with 156 respondents.

The study showed that transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership have positive impact on return on assets. In addition, transformational leadership, transactional leadership, laissez-faire leadership, supportive leadership and participative leadership have positive impact on return on equity in Nepalese commercial banks. The study concluded that better leadership directed towards the employees leads to higher level of productivity of the employees towards the organization which results in higher organizational performance. The study also concluded that supportive leadership is the most influencing factors that explain the changes in financial performance of Nepalese commercial banks.

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## Abstract

*This study examines the impact of human resource management practices on employee satisfaction and loyalty in the context of Nepalese commercial banks. Employee satisfaction and employee loyalty are the dependent variables. The selected independent variables are compensation, training and development, performance appraisal, recruitment and selection, career planning and job design. The primary source of data is used to assess the opinions of the respondents regarding human resource management practices, loyalty and level of job satisfaction in Nepalese commercial banks. The study is based on primary data with 120 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the significance and importance of human resource management practices on employee job satisfaction and loyalty in Nepalese commercial banks.*

*The study showed that compensation has positive impact on employee satisfaction and loyalty. This reveals that higher the compensation in the banks, higher would be the employee satisfaction and loyalty. The result also showed that training and development have positive impact on employee satisfaction and loyalty. It implies that increase in training and development programs leads to increase in employee satisfaction and loyalty. In addition, performance appraisal has positive impact on employee satisfaction and loyalty. It indicates that fair performance appraisal leads to increase in employee satisfaction and loyalty. Similarly, recruitment and selection have positive impact on employee satisfaction and loyalty. It reveals that better the recruitment and selection process, higher would be the employee satisfaction and loyalty. The result also showed that job design has positive impact on employee satisfaction and loyalty. This reveals that better job design leads to increase in employee satisfaction and loyalty. Furthermore, career planning has positive impact on employee satisfaction and loyalty. It reveals that better career planning and counselling leads to increase in employee satisfaction and loyalty.*

**Key words:** Employee satisfaction, employee loyalty, compensation, training and development, recruitment and selection, performance appraisal, career planning and job design.

# 1. Introduction

The success or failure of an organization depends on the quality of human resources (Rynes et al., 2004). The training of workers is an integral part of the strategy to integrate human resources management with an organization's business strategy. Creating a workplace which is safe, stimulating and enjoyable is the key to obtain desired performance from the employees (Cherif, 2020). Nowadays, organizations are experiencing a balance of power shifting from employers to employees. Employees can be retained and satisfied within those organizations which keep on learning that how to keep their employee satisfaction at the highest level. If there is excess of turnover then it indicates towards a basic problem within the company. For such organization, it is important to be familiar with how to retain employees. One of the most used ways of retaining employees is compensating them more than they are earning (Schuler and MacMillan, 1984). Employees are considered the core of an organization and the success or failure of the organization is attributed to the performance of the employees. It is of prime importance that the employees are loyal to the organization and don't actively search for other alternative opportunities (Mitchell et al., 2001). In this today's competitive business world, it is not only important for the organizations to earn profit but it has become most important to satisfy competitive employees. Retention of employees is not so easy, until an organization provide them with intrinsic and extrinsic rewards and opportunities for career progression. This can be done through career counseling and goal setting, so that employees can understand their abilities and take correct action plans to fulfill their career goals (Cardon and Stevens, 2004). Slatten et al. (2021) examined the relationships between HR practices and organizational commitment in addition to operational and financial performance measures. The study showed that the employees who are managed in accordance with the HR practices turn out to be highly committed to their organization.

Harel and Tzafrir (1999) concluded that effectiveness of human resource practices, particularly, employee selection procedures, compensation management, employee training and development, career growth opportunity have a direct effect on employees' performance and organizational productivity. Weerasinghe et al. (2017) examined the factors affecting job satisfaction of banking employees in Sri Lanka. The study found that salary has a positive and significant impact on employee's job satisfaction. Ali and Ahmed (2009) revealed that there is a significant positive relationship between reward and employee performance. Nguyen et al. (2015) showed that earning, work environment and promotion opportunities positively influence employee performance. Similarly, compensation, job promotions, and job satisfaction have a positive effect on employee performance (Rinny, 2020). Parvin and Kabir (2011) revealed that support of supervisor and co-worker relation are the most important factors contributing to employee job satisfaction. Further, Karatepe (2010) showed that supervisory support reduces the effect of emotional exhaustion on job satisfaction and positively influence the job satisfaction. Similarly, Shah et al. (2018) stated that there is a significant and positive relationship of compensation and employee empowerment with job satisfaction. Satisfied employees are creative and innovative in the organization.

Arokiasamy et al. (2013) examined the effects of reward system and motivation on job satisfaction in the education industry in Malaysia. The study found that there is a positive significant relationship between reward system and employee job satisfaction. Likewise, Aloysius and Christy (2013) assessed the mediating effect of job satisfaction on the relationship between rewards and employee's loyalty. The study concluded that there is a significant positive relationship between reward system and job satisfaction. In addition, Antara et al. (2020) analyzed the effect of performance appraisal and work environment towards employee performance mediated by job satisfaction. The study found that performance appraisal system has a positive and significant relationship with job satisfaction and employee job performance. Moreover, Saleem (2012)

investigated the impact of performance appraisal on job satisfaction in banking sector of Pakistan. The study found that there is a positive and significant relationship between performance appraisal system and employee job performance. Mendis and Weerakkody (2017) examined the impact of work life balance on employee performance with reference to telecommunication industry in Sri Lanka. The study revealed that there is a strong relationship between work life balance and employee performance. The study also concluded that the better work life balance of the employees leads to increased employee performance and employee job satisfaction.

Woerkom and Kroon (2020) analyzed the effect of strengths-based performance appraisal on perceived supervisor support and the motivation to improve performance. The study revealed that strengths-based performance appraisal system and performance rating were positively related to employee job performance. Moreover, Ratnasari and Sutjahjo (2019) revealed that career development and work motivation have positive impact on employee job satisfaction. In addition, Santoso et al. (2021) examined the effect of career development, work discipline and work environment to job satisfaction. The study revealed that career development has a significant influence on improving employee job performance. Manggis et al. (2018) examined the effect of career development and organizational culture to employee performance with motivation of work as intervening variable in cooperation in Denpasar village. The study showed career development has positive and significant effect on employee job performance. Mabaso and Dlamini (2017) showed positive and significant effect of compensation on employee job satisfaction. Similarly, Zeb et al. (2018) assessed the influence of compensation and benefits and employee's involvement on employee's outcomes. The study showed the relationship between employee job performance and compensation are statistically significant and positive. Moreover, Baqi and Indradewa (2021) analyzed the effect of compensation on job satisfaction of permanent employees and contract employees. The study revealed that there is a significant relationship between compensation indicators and employee job satisfaction.

In the context of Nepal, Thami (2022) examined the impact of wages, working environment, work arrangement, job skills and stress management on employee performance in Nepalese insurance companies. The study showed a significant positive effect of wages and working environment on employee performance. Similarly, Kunwar (2022) assessed the effect of work environment on employee performance and productivity in Nepalese commercial banks. The study showed a significant positive effect of training and development, work life balance, supervisory support, compensation and working environment on employee performance and productivity. Shrestha and Parajuli (2020) examined the core aspects of the practices of functional human resource management in Nepalese commercial banks and insurance companies. The study found differences between commercial banks and insurance companies in functional HRM practices in terms of employee selection and placement and in the management of pay and bonus schemes. Moreover, Thagunna (2020) examined the factors impacting employees' performance in Nepalese commercial banks. The study showed that organizational culture, physical work environment, work-life balance, supervisor support and workplace incentives have positive impact on employees' performance in Nepalese commercial banks. According to Mishra and Shrestha (2019), better management of human resources mobilization and working environment leads to increase in job satisfaction of the employees.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of HRM practices on employee satisfaction and loyalty. 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 analyze the impact of human resource management practices on employee satisfaction and loyalty in the context of Nepalese commercial banks. More specifically, it examines the impact of compensation, training and development, performance appraisal, recruitment and selection, career planning and job design on employee satisfaction and loyalty in Nepalese commercial banks.

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

## 2. Methodological aspects

The study is based on the primary data. The data were gathered from 120 respondents through questionnaire. The respondents' views were collected on compensation, training and development, performance appraisal, recruitment and selection, career planning, job design and level of 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 commercial banks selected for the study along with the number of respondents.

**Table 1:** List of commercial banks selected for the study along with the number of respondents

| S.N. | Name of the commercial banks    | Number of respondents |
|------|---------------------------------|-----------------------|
| 1    | Sunrise Bank Limited            | 9                     |
| 2    | Rastriya Banijya Bank Limited   | 4                     |
| 3    | Nepal SBI Bank Limited          | 3                     |
| 4    | NIC Asia Bank Limited           | 6                     |
| 5    | Kumari Bank Limited             | 5                     |
| 6    | Nabil Bank Limited              | 4                     |
| 7    | NMB Bank Limited                | 4                     |
| 8    | Everest Bank Limited            | 8                     |
| 9    | Himalayan Bank Limited          | 7                     |
| 10   | Sanima Bank Limited             | 11                    |
| 11   | Global IME Bank Limited         | 12                    |
| 12   | Civil Bank Limited              | 14                    |
| 13   | Century Commercial Bank Limited | 8                     |
| 14   | Prime Commercial Bank Limited   | 7                     |
| 15   | Prabhu Bank Limited             | 6                     |
| 16   | Siddhartha Bank Limited         | 9                     |
| 17   | Mega Bank Nepal Limited         | 3                     |
|      | Total number of respondents     | 120                   |

**Source:** Field survey, 2022

Thus, the study is based on 120 respondents.



## The model

The model estimated in this study assumes that employee satisfaction and employee loyalty depend on compensation, training and development, performance appraisal, recruitment and selection, career planning and job design. Therefore, the model takes the following form:

$$\begin{aligned} ES &= \beta_0 + \beta_1 C + \beta_2 RS + \beta_3 TD + \beta_4 CP + \beta_5 PA + \beta_6 JD + e \\ EL &= \beta_0 + \beta_1 C + \beta_2 RS + \beta_3 TD + \beta_4 CP + \beta_5 PA + \beta_6 JD + e \end{aligned}$$

Where,

$$\begin{aligned} ES &= \text{Employees satisfaction} \\ EL &= \text{Employees loyalty} \\ C &= \text{Compensation} \\ RS &= \text{Recruitment and selection} \\ TD &= \text{Training and development} \\ CP &= \text{Career planning} \\ PA &= \text{Performance appraisal} \\ JD &= \text{Job design} \end{aligned}$$

Compensation was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “My organization utilize a traditional salary grade system”, “My organization have a fair bonus or incentive plan” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.854$ ).

Training and development were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “Every employee goes through various training programs every year”, “Training has made positive change in the organization” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.877$ ).

Performance appraisal was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “There is a formal and written performance appraisal system”, “Appraisal system has a strong impact on individual and team performance” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.709$ ).

Recruitment and selection were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “My bank places the right person in the right job”, “Selection of a candidate in our bank is strictly based on his /her merit” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.901$ ).

Career planning was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “Career development is the responsibility of the employer”, “Our organization prefers an internal employee whenever a vacancy opens up” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.839$ ).

Job design was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include

“I can perform my tasks well because they are less complex and balance my work and personal life”, “The job gives me a chance to use my personal initiative or judgment in carrying out the work” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.845$ ).

Employees satisfaction was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “Overall, I am quite satisfied with my job”, “I would refer my friends and relatives to work in this bank” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.942$ ).

Employees loyalty was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 5 for strongly agree and 1 for strongly disagree. There are 5 items and sample items include “I speak positively about my bank when talking to customers”, “I consider myself as a loyal employee” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.913$ ).

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

## Compensation

An effective compensation system design significantly influences organizational development by revealing external competitiveness, internal equity and individual equity. For individuals, compensation is not only the return of benefits, but it also reflects on individuals’ capabilities or achievements (Ali, 2009). Lai (2011) examined the influence of compensation system design on employee satisfaction in Taiwan. The study showed a positive correlation between employee satisfaction and job-based pay, skill-based pay and performance-based pay. Compensation is an important determinant of employees’ satisfaction. A good compensation package is important to motivate the employees to increase the organizational productivity.

Compensation has a high effect on employee retention within a company because with satisfactory compensation, employees will feel that the company is caring about employee needs. Syahreza et al. (2017) examined the effect of compensation on employee performance in the hospitality industry in Medan City, North Sumatra, Indonesia. The results showed that compensation has a significant positive effect on performance. Similarly, compensation has a significant positive effect on retention. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship of compensation with employee satisfaction and employee loyalty.

## Training and development

Training and development are indispensable strategic tool for enhancing employee performance. Training is the organized procedure by which people learn knowledge or skills for a definite purpose. The objective of training is to achieve a change in the behaviour of those trained. This means that the trainees shall acquire new manipulative skills, technical knowledge and skills on the job in such a way as to aid in the achievement of organizational goals (Archieve, 2008). Afroz (2018) examined the effects of training on employee performance in banking sector, Tangail, Bangladesh. The study showed that general training enhances employee engagement, employee motivation and job satisfaction. Terera and Ngrande (2014)

explored the impact of training on job satisfaction and retention of employees at a selected tertiary institution. The results revealed that there is no significant relationship between training and employee retention. However, there is a significant positive relationship between employee job satisfaction and training. Employees require extensive training to acquire the necessary skills to be able to make substantive contribution towards the organisation growth (Arsmtrong, 2001). Dabale et al. (2014) determined the relationship between training and employee performance in Mutare City Council, Zimbabwe. The study established that there is a strong positive relationship between training and performance of employees. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship of training and development with employee satisfaction and employee loyalty.

## **Recruitment and selection**

HR Practices play crucial role towards employees' job-related outcomes that ultimately leads towards effective organizational performance. Recruitment and selection process are important practices for human resource management, and are crucial in affecting organizational success. Uzair et al. (2017) examined the relationship between HR practices, loyalty and commitment with mediating role of job satisfaction in banks of Gujranwala Pakistan. The results revealed that training and development, performance appraisal, compensation, career development and recruitment and selection are significantly and positively related to employees' loyalty and their commitment. Moreover, Janjua and Gulzar (2014) explored the impact of human resource practices on employee retention and employee commitment in the telecom Sector of Pakistan. The results showed that different human resource practices such as training, compensation, career development and recruitment and selection have a significant positive impact on the employee commitment, satisfaction and employee retention. In addition, Gamage (2014) examined the recruitment and selection practices in manufacturing SMEs in Japan. The study showed a positive association between recruitment and selection and employee performance. Furthermore, Saleem et al. (2013) assessed the determinants of job satisfaction among employees of banking industry at Bahawalpur. The study revealed a positive relationship of recruitment and selection with employee performance and satisfaction. Based on it, the study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of recruitment and selection with employee satisfaction and employee loyalty.

## **Performance appraisal**

Performance evaluation is an important element of loyalty because it is positively related to organizational commitment and negatively related to turnover intentions. Satisfactory appraisal system is also necessary to have steady performance by employees. The appraisal fairness provides perceived fairness to the employees, elicits employee satisfaction and organizational performance (Hassan et al., 2013). Matzler and Renzl (2006) found that performance evaluation plays a significant positive role in enhancing employee satisfaction and loyalty. Murali et al. (2007) showed a positive relationship between employee loyalty, organizational performance and performance evaluation. Moreover, Balouch and Hassan (2014) examined the determinants of job satisfaction and its impact on employee performance and turnover intentions. The study revealed a positive relationship of fair appraisal system with employee performance and satisfaction. The performance appraisal is considered to be an integral part of the human resource practices in organizations. Further, Arshad et al. (2013) assessed the effects of performance appraisal politics on job satisfaction, turnover intention and loyalty to supervisor in the telecom organizations of Pakistan. The

study showed a positive association between performance appraisal and employee performance. Based on it, this study develops the following hypothesis:

H4: There is a positive relationship of performance appraisal with employee satisfaction and employee loyalty.

## Career planning

Career development planning is important for both the individuals and for the organization because it is not possible to plan for the career without identifying the needs of organization and competencies of employees (Lingham, 2000). Career planning is an ongoing process where employees explore their abilities, plan accordingly and then create work success and achieve their goals (Savickas, 2005). Shujaat et al. (2013) determined the relationship between career development opportunities available to the employees and their job satisfaction on private banks in Karachi. The study determined that there is positive relationship between career development and employee job satisfaction in banking sector. Employees are satisfied with career development activities that are offered at their organizations. Corporate world has become more competitive; hence employees have become more conscious to career development. Employees get emotionally attached with the organization when they realize that management is protecting their positions by making them worthy through properly planning for their career which encourages their attachment with their work place. Moreover, Chen et al. (2004) investigated the career development programs, job satisfaction, professional development and productivity in the context of Taiwan. The study found a positive association between career development programs, job satisfaction, professional development and productivity. Furthermore, Nadarajah et al. (2012) assessed the relationship between HR practices and job performance of academicians towards career development in Malaysian private higher institutions. The study showed a positive relationship between job performance and career development programs. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of career planning with employee satisfaction and employee loyalty.

## Job design

Job design is one of the major components for employee performance. Designing jobs and roles appropriately is very imperative in elevating the performance of employees. Hackman and Oldham (1976) identified five core dimensions which are skill variety, task identity, task significance, autonomy and feedback. It added more value and practical approach to the job design with changing circumstance. These dimensions have positive effect on the productivity and satisfaction of the employees. Kariuki and Makori (2015) examined the role of job design on employee engagement in private universities in Kenya. The study found a positive association between job design, employee engagement and productivity. Similarly, Ali and Zia-ur-Rehman (2014) assessed the impact of job design on employee performance, mediating role of job satisfaction in FMCG's sector in Pakistan. The study found that skill variety, task identity, task significance, job autonomy and feedback have positive effect on employee performance. The study concluded that there is a positive relationship between job design and employee performance. In order to enhance individual performance, feedback channels play significant part in organizations (Elkins and Phillips, 2000). Moreover, this feedback can yield productive result in the development of employees' attitudes and conduct. Favorable feedback can be taken as an additional motivation in employees to

accomplish their career targets (Lam et al., 2002). Adler (1991) found that skill variety, task significance, autonomy, and feedback have positive effect on the level of satisfaction and internal work motivation. Based on it, the study develops the following hypothesis:

H<sub>6</sub>: There is a positive relationship of job design with employee satisfaction and employee 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 2.

**Table 2:** Kendall's Tau correlation coefficient matrix

This table presents Kendall's Tau correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 120 observations. The dependent variables are ES (Employee satisfaction) and EL (Employee loyalty). The independent variables are C (Compensation), TD (Training and development), PA (Performance appraisal), RS (Recruitment and selection), CP (Career planning) and JD (Job design).

| Variables | Mean  | SD    | C       | TD      | PA      | RS      | CP      | JD      | ES      | EL |
|-----------|-------|-------|---------|---------|---------|---------|---------|---------|---------|----|
| <b>C</b>  | 3.780 | 0.567 | 1       |         |         |         |         |         |         |    |
| <b>TD</b> | 3.990 | 0.618 | 0.530** | 1       |         |         |         |         |         |    |
| <b>PA</b> | 3.565 | 0.550 | 0.550** | 0.560** | 1       |         |         |         |         |    |
| <b>RS</b> | 3.768 | 0.577 | 0.371** | 0.414** | 0.412** | 1       |         |         |         |    |
| <b>CP</b> | 3.593 | 0.596 | 0.463** | 0.413** | 0.542** | 0.434** | 1       |         |         |    |
| <b>JD</b> | 3.613 | 0.607 | 0.471** | 0.435** | 0.400** | 0.411** | 0.480** | 1       |         |    |
| <b>ES</b> | 3.567 | 0.707 | 0.629** | 0.529** | 0.482** | 0.418** | 0.612** | 0.512** | 1       |    |
| <b>EL</b> | 3.748 | 0.692 | 0.589** | 0.489** | 0.502** | 0.432** | 0.499** | 0.557** | 0.638** | 1  |

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

Table 2 shows that compensation is positively correlated to employee satisfaction. This reveals that higher the compensation in the banks, higher would be the employee satisfaction. The result also shows that training and development are positively correlated to employee satisfaction. It implies that increase in training and development programs leads to increase in employee satisfaction. In addition, performance appraisal is positively correlated to employee satisfaction. It indicates that fair performance appraisal leads to increase in employee satisfaction. Similarly, recruitment and selection are also positively correlated to the employee satisfaction. It reveals that better the recruitment and selection process, higher would be the employee satisfaction. The result also shows that job design is also positively correlated to employee satisfaction. This reveals that better job design leads to increase in employee satisfaction. Furthermore, career planning is positively correlated to the employee satisfaction. It reveals that better career planning and counselling leads to increase in employee satisfaction.

In addition, the study also shows that career planning is positively correlated to the employee loyalty. It reveals that better career planning and counselling leads to increase in employee loyalty. Similarly, recruitment and selection are also positively correlated to the employee loyalty. It reveals that better the recruitment and selection process, higher would be the employee loyalty. The result also shows that training and development are positively correlated to employee loyalty. It implies that increase in training and development programs

leads to increase in employee loyalty. Moreover, compensation is positively correlated to employee loyalty. This reveals that higher the compensation in the banks, higher would be the employee loyalty. In addition, performance appraisal is positively correlated to employee loyalty. It indicates that fair performance appraisal leads to increase in employee loyalty. Furthermore, the result also shows that job design is also positively correlated to employee loyalty. This reveals that better job design leads to increase in employee loyalty.

## Regression analysis

Having examined the Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 3. More specifically, it presents the regression results of compensation, training and development, performance appraisal, recruitment and selection, career planning and job design on employee satisfaction in the context of Nepalese commercial banks.

**Table 3:** Estimated regression results of compensation, training and development, performance appraisal, recruitment and selection, career planning and job design on employee satisfaction

The results are based on 120 observations using linear regression model. The model is  $ES = \beta_0 + \beta_1 C + \beta_2 RS + \beta_3 TD + \beta_4 CP + \beta_5 PA + \beta_6 JD + e$ , where dependent variable is ES (Employee satisfaction). The independent variables are C (Compensation), TD (Training and development), PA (Performance appraisal), RS (Recruitment and selection), CP (Career planning) and JD (Job design).

| Model | Intercept         | Regression coefficients of |                    |                     |                  |                     |                     | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F-value |
|-------|-------------------|----------------------------|--------------------|---------------------|------------------|---------------------|---------------------|------------------------------------|-------|---------|
|       |                   | C                          | TD                 | PA                  | RS               | CP                  | JD                  |                                    |       |         |
| 1     | 0.210<br>(0.809)  | 0.840<br>(14.707)**        |                    |                     |                  |                     |                     | 0.644                              | 0.422 | 216.299 |
| 2     | 0.610<br>(1.884)* |                            | 0.741<br>(9.236)** |                     |                  |                     |                     | 0.415                              | 0.541 | 85.306  |
| 3     | 0.488<br>(1.433)  |                            |                    | 0.775<br>(10.094)** |                  |                     |                     | 0.459                              | 0.520 | 101.889 |
| 4     | 1.144<br>(0.643)  |                            |                    |                     | 0.643<br>(0.525) |                     |                     | 0.269                              | 0.604 | 44.869  |
| 5     | 0.479<br>(1.743)  |                            |                    |                     |                  | 0.809<br>(11.392)** |                     | 0.520                              | 0.490 | 129.771 |
| 6     | 0.557<br>(2.026)* |                            |                    |                     |                  |                     | 0.783<br>(11.091)** | 0.506                              | 0.497 | 123.013 |
| 7     | 0.578<br>(2.132)* | 0.817<br>(9.724)**         | 0.264<br>(3.415)** |                     |                  |                     |                     | 0.674                              | 0.404 | 123.748 |
| 8     | 0.668<br>(2.446)* | 0.740<br>(7.894)**         | 0.191<br>(2.194)*  | 0.190<br>(1.798)    |                  |                     |                     | 0.680                              | 0.400 | 85.150  |
| 9     | 0.625<br>(2.197)* | 0.753<br>(7.776)**         | 0.202<br>(2.258)*  | 0.203<br>(1.873)*   | 0.49<br>(0.566)  |                     |                     | 0.678                              | 0.401 | 63.568  |
| 10    | 0.605<br>(2.283)* | 0.700<br>(7.683)**         | 0.146<br>(1.728)   | 0.030<br>(0.277)    | 0.182<br>(2.102) | 0.424<br>(4.303)**  |                     | 0.720                              | 0.374 | 62.305  |
| 11    | 0.617<br>(2.351)* | 0.653<br>(6.938)**         | 0.120<br>(1.410)   | 0.059<br>(0.541)    | 0.205<br>(2.357) | 0.317<br>(2.765)**  | 0.183<br>(1.771)    | 0.725                              | 0.370 | 53.416  |

### 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 satisfaction is the dependent variable.

Table 3 shows that the beta coefficients for compensation are positive with employee satisfaction. It indicates that compensation has a positive impact on employee satisfaction. This finding is similar to the findings of Syahreza et al. (2017). Likewise, the beta coefficients for training and development are positive with employee satisfaction. It indicates that training and development have a positive impact on employee satisfaction. This finding is consistent with the findings of Terera and Ngirande (2014). Similarly, the beta coefficients for performance appraisal are positive with employee satisfaction. It indicates that performance appraisal has a positive impact on employee satisfaction. This finding is similar to the findings of Balouch and Hassan (2014). Moreover, the beta coefficients for career planning are positive with employee satisfaction. It indicates that career planning has a positive impact on employee satisfaction. This finding is consistent with the findings of Chen et al. (2004). Furthermore, the beta coefficients for job design are positive with employee satisfaction. It indicates that job design has a positive impact on employee satisfaction. This finding is similar to the findings of Kariuki and Makori (2015).

Table 4 shows the regression results of compensation, training and development, performance appraisal, recruitment and selection, career planning and job design on employee loyalty in the context of Nepalese commercial banks.

**Table 4:** Estimated regression results of compensation, training and development, performance appraisal, recruitment and selection, career planning and job design on employee loyalty

The results are based on 120 observations using linear regression model. The model is  $EL = \beta_0 + \beta_1 C + \beta_2 RS + \beta_3 TD + \beta_4 CP + \beta_5 PA + \beta_6 JD + e$ , where dependent variable is EL (Employee loyalty). The independent variables are C (Compensation), TD (Training and development), PA (Performance appraisal), RS (Recruitment and selection), CP (Career planning) and JD (Job design).

| Model | Intercept          | Regression coefficients of |                    |                    |                    |                    |                    | Adj. R <sub>bar</sub> <sup>2</sup> | SEE    | F-value |
|-------|--------------------|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|------------------------------------|--------|---------|
|       |                    | C                          | TD                 | PA                 | RS                 | CP                 | JD                 |                                    |        |         |
| 1     | 0.485<br>(1.612)   | 0.863<br>(10.963)**        |                    |                    |                    |                    |                    | 0.500                              | 0.489  | 120.185 |
| 2     | 1.120<br>(3.331)** |                            | 0.659<br>(7.909)** |                    |                    |                    |                    | 0.341                              | 0.5618 | 62.553  |
| 3     | 0.831<br>(2.622)*  |                            |                    | 0.718<br>(7.312)** |                    |                    |                    | 0.419                              | 0.527  | 86.706  |
| 4     | 1.146<br>(3.333)** |                            |                    |                    | 0.691<br>(7.659)** |                    |                    | 0.326                              | 0.568  | 58.655  |
| 5     | 0.978<br>(3.357)** |                            |                    |                    |                    | 0.671<br>(7.636)** |                    | 0.306                              | 0.519  | 42.617  |
| 6     | 0.915<br>(3.275)** |                            |                    |                    |                    |                    | 0.776<br>(8.286)** | 0.468                              | 0.504  | 105.808 |
| 7     | 0.124<br>(0.391)   | 0.685<br>(6.933)**         | 0.259<br>(2.850)** |                    |                    |                    |                    | 0.529                              | 0.475  | 67.782  |
| 8     | 0.017<br>(0.54)    | 0.563<br>(5.171)**         | 0.144<br>(1.423)   | 0.298<br>(2.427)*  |                    |                    |                    | 0.548                              | 0.465  | 49.039  |
| 10    | 0.155<br>(482)     | 0.485<br>(4.384)**         | 0.071<br>(0.691)   | 0.144<br>(1.092)   | 0.089<br>(0.843)   | 0.262<br>(2.186)   |                    | 0.569                              | 0.454  | 32.452  |
| 11    | 0.175<br>(0.554)   | 2.797<br>(3.627)**         | 0.484<br>(3.257)** | 3.473<br>(5.298)** | 0.208<br>(0.917)   | 3.873<br>(5.283)** | 0.223<br>(2.339)*  | 0.586                              | 0.445  | 29.016  |

**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 loyalty is the dependent variable.



Table 4 shows that the beta coefficients for compensation are positive with employee loyalty. It indicates that compensation has a positive impact on employee loyalty. This finding is similar to the findings of Afroz (2018). Likewise, the beta coefficients for training and development are positive with employee loyalty. It indicates that training and development have a positive impact on employee loyalty. This finding is consistent with the findings of Janjua and Gulzar (2014). Similarly, the beta coefficients for performance appraisal are positive with employee loyalty. It indicates that performance appraisal has a positive impact on employee loyalty. This finding is similar to the findings of Arshad et al. (2013). Moreover, the beta coefficients for career planning are positive with employee loyalty. It indicates that career planning has a positive impact on employee loyalty. This finding is consistent with the findings of Nadarajah et al. (2012). Furthermore, the beta coefficients for job design are positive with employee loyalty. It indicates that job design has a positive impact on employee loyalty. This finding is similar to the findings of Elkins and Phillips (2000).

## 4. Summary and conclusion

In current era of highly volatile business environment, organizations are facing emerging challenges in form of acquisition and optimization of human resource. Human resources are considered as a source of sustainable competitive advantage. The success of an organization depends upon several factors but the most crucial factor that affects the organization performance is its employee. Human resource is considered as a valuable asset as the success of an organization lies upon how productive the employees of an organization are in terms of achieving the goals of the organization. Efficient human resource management and maintaining higher job satisfaction level in banks determine not only the performance of the bank but also affect the growth and performance of the entire economy.

This study attempts to examine the impact of human resource management practices on employee satisfaction and loyalty in the context of Nepalese commercial banks. The study is based on primary data with 120 observations.

The study showed that compensation, training and development, performance appraisal, recruitment and selection, career planning and job design have positive impact on employee job satisfaction and loyalty in Nepalese commercial banks. The study showed that better practice of human resource management lead to higher level of employee job satisfaction and loyalty in Nepalese commercial banks. The study concluded that compensation followed by career planning are the most influencing factors that explain the employee job satisfaction. The study also concluded that compensation followed by job design are the most influencing factors that explain the loyalty in Nepalese commercial banks.

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## Abstract

*This study examines the effect of gamified human resource management system on job satisfaction and engagement in Nepalese commercial banks. Job satisfaction and employee engagement are the dependent variables. The selected independent variables are enjoyment of gaming, recognition through gaming, motivation, learning and development and usefulness in gaming. The primary source of data is used to assess the opinions of the respondents regarding gamified human resource management system, level of job satisfaction and engagement in Nepalese commercial banks. The study is based on primary data with 146 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 gamified human resource system on employee job satisfaction and engagement in Nepalese commercial banks.*

*The study showed that enjoyment in gaming has a positive impact on employee job satisfaction and engagement. It implies that better enjoyment in gaming leads to increase in employee job satisfaction and engagement. The result also revealed that recognition through gaming has a positive impact on employee job satisfaction and engagement. It implies that better recognition through gaming in the organization leads to increase in employee job satisfaction and engagement. Moreover, motivation has also positive impact on employee job satisfaction and engagement. It implies that higher the level of motivation, higher would be the employee job satisfaction and engagement. Furthermore, learning and development have positive impact on employee job satisfaction and engagement indicating better learning and development leads to increase in employee job satisfaction and engagement. Similarly, the result also showed that usefulness in gaming has a positive impact on employee job satisfaction and engagement in the organization. It indicates that increase in usefulness in gaming leads to increase in employee job satisfaction and engagement.*

**Key words:** Job satisfaction, engagement, enjoyment of gaming, recognition of gaming, motivation, learning and development and usefulness in gaming.



# 1. Introduction

Organizational learning is essential for the optimization of organizational production. Creating, retaining, and transferring knowledge are essential parts of organizational learning and an indication of the company's performance and level of competitiveness (Argote and Fahrenkopf, 2016). Gamification is the term used to describe applying game mechanics to influence users' perception of a certain task or activity in a way that boosts their motivation while doing it. Gamification provides all the attractive and addictive features traditionally found in games and implement them in real life productive activities. The aim is to influence and motivate players to participate in a targeted behavior or action. This influence will improve employees' commitment, which simultaneously enhances successful engagement in the desired behavior. The pressures associated with the speed of competition, including the digitalization of workspaces, are increasing the need for modern organizations to drive employee satisfaction and engagement. Integrating gamification into the workplace has been identified as a possible strategy to promote employee participation, engagement, and loyalty. Gamification of HRM practices includes the introduction of game-like elements into the core activities that underpin HR practices such as knowledge sharing (e.g., sharing employees' stories and best practices). Gamification of HR practices, including recruitment and training, is accomplished by motivating employees to engage in games designed around these core processes. These games entail competition among employees to share their expertise and knowledge with each other and employees can be rewarded through virtual badges, leadership boards, and a 'hall of fame' (Cardador et al., 2017). These gamified elements promote friendly competition among colleagues, the active sharing of knowledge, and the recognition of others for their achievements.

Gamification tries to foster enjoyment in everyday tasks by relying on a person's psychological need for satisfaction, where the players are rewarded with short-term and long-term achievements, which are publicly shared within the organization (Hamari, 2017). Gamification can be employed to address a variety of personal needs, such as the need to be competent, which includes feelings of efficiency and success (Vansteenkiste and Ryan, 2013). Moreover, gamification also fulfills the need for autonomy in the form of psychological freedom and volition when performing a particular task and the need for social interaction, such as feelings of belonging to a group of significant others. Gamified elements encourage people to engage in work-related activities for intrinsic reasons rather than some extrinsic reward (Seaborn and Fels, 2015). Competition triggered by leaderboards shared across the organization have been employed to harness social pressure to increase engagement and consequently, to promote participation (Kahn, 1990). While performing the gamified job tasks, an employee could be psychologically connected, present, and fully immersed in the job task, which can result from their desire to improve job satisfaction (Rich et al., 2010). Gamification can be implemented in various organizational processes where it has been found to have positive attributes (Bozkurt and Durak, 2018). It gained public attention for its numerous applications that include productivity, finance, health, education, sustainability, as well as news and entertainment media (Toth et al., 2019).

Gamification is defined by the implementation of game-based elements such as mechanics, aesthetics, and game thinking in non-game contexts with the overall aim of engaging people, motivating action, enhancing learning and solving problems (Zainuddin et al., 2020). Gamification can also be implemented by creating competitive scenarios within the organizational process. The competitive scenarios are created using game design elements within the organization which also improve employee's productivity levels. Reward and recognition take a more complex form with organizational gamification. Gamified processes increase employees' managerial recognition and elevate their status among their peers boosting their confidence



and working outcomes (Salleh et al., 2017). Bright and Ponis (2021) stated that gamification includes 75% psychology and 25% technology and can be applied to any process in real organization starting with recruitment and ending with training and development. From the psychological perspective, gamification increases employee engagement through inner motivation, aim setting and experience of competition (DuVernet and Popp, 2014). Involvement in games can change employee behavior, allow them to view their organization from the different perspective (Hughes and McCoy, 2015). Businesses currently are looking for new innovative ways to engage employees and gamification is one such option. Sarangi and Shan (2015) found that playful activities and well-developed gamification as part of HR process can decrease employee burnout as well as can have far-reaching benefits. Gamification is an effective component of learning and development process. It can improve organizational culture, reveal talents, foster innovation and engagement (Kumar and Raghavendran, 2015).

Silic et al. (2020) investigated the role of gamification in fostering job satisfaction and engagement. The study revealed employee's perception of the recognition they receive in a gamified HRM system is positively associated with reciprocal benefits. Similarly, employee's perceived usefulness of the gamified HRM system is positively associated with performance expectancy. Hamza and Tovolgyi (2022) carried out a case study in a Lebanese bank to measure the effects of gamified E-learning. The results showed that the adoption of gamified E-learning and employees' engagement levels were positively associated. Gamification also proved its importance in influencing employees' behaviour by creating a competitive environment and engaging employees on a knowledge-oriented platform. Engaged employees tend to be dynamic, enthusiastic, and determined to perform their jobs (Menguc et al., 2013). New practices can facilitate such engagement by supporting resource exchanges, interactions, and reciprocal well-being (Hollebeek et al., 2019). However, such engagement requires diligent management. Some service companies have experimented with creating fun experiences as a means for enhancing employee engagement, with the sense that fun can increase employees' job satisfaction and engagement and ultimately improve their wellbeing and performance. For example, inspired by the popularity of games, especially video games, proactive managers have used game-based design principles to structure work experiences in a process called gamification (Mitchell et al., 2020).

In gamification process, fun and engaging elements typically found in games are adopted to enhance people's commitment to and engagement in real-world productive activities (Chou, 2016). Gamified apps and software are increasing in number and range across organizational settings (Vesa et al., 2017). Arguably, gamification may motivate employees not only by providing them with increased access to visible, comparable, and immediate performance information but also by making the work task more enjoyable and meaningful (Cardador et al., 2017). To this end, gamification is commonly operationalized through individual and collective challenges that aim at generating a sense of achievement and continuous success by completing intermediate goals (Groening and Binnewies, 2019). This sense of accomplishment, leveraging appraisal, and feedback system encourage participants' engagement, with resulting influences on their emotions, cognitions, and behaviors (Mullins and Sabhervat, 2020). The choice of gamification mechanisms, rewards, and appraisal systems affect work experiences at both the individual and organizational levels (Warmeling et al., 2020). In that respect, the challenges, behavior monitoring, and feedback associated with gamification may alter participants' satisfaction with the activity undertaken (Mulcahy et al., 2018).

In the context of Nepal, Pathak (2018) analyzed the link between working hour, income level and organizational support with work-life balance of employees working in selected commercial banks of Nepal. The study found the inverse relationship between the work life balance and number of children

in the banking sector of Nepal. Adhikari (2019) explored the impact of quality of work-life balance on job satisfaction in Nepalese commercial banks. The study concluded that there is positive relationship of working environment with job satisfaction which indicates that better the working environment, higher would be the job satisfaction. Chaudhary and Sharma (2012) showed that the employee motivation has direct impact on productivity and growth. A highly motivated employee works hard in carrying out each and every duty and responsibility. Similarly, Biswakarma (2015) revealed that working environment, team work and employee attitude have positive and significant relationship with employee performance. According to Mishra and Shrestha (2019), better management of human resources mobilization and working environment leads to increase in job satisfaction of the employees.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the impact of gamified human resource management system on job satisfaction and 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 analyze the impact of gamified human resource management system on job satisfaction and engagement in the context of Nepalese commercial banks. More specifically, it examines the impact of enjoyment of gaming, recognition through gaming, motivation, learning and development and usefulness in gaming on employee job satisfaction and engagement 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 were gathered from 146 respondents through questionnaire. The respondents' views were collected on enjoyment of gaming, recognition through gaming, motivation, learning and development and usefulness in gaming in the banks. The study is based on descriptive and causal comparative research designs.

### The model

The model estimated in this study assumes that job satisfaction and engagement depend on enjoyment of gaming, recognition through gaming, motivation, learning and development, usefulness in gaming. Therefore, the model takes the following form:

$$JS = \beta_0 + \beta_1 EG + \beta_2 RG + \beta_3 MT + \beta_4 LD + \beta_5 UG + e$$

$$ENG = \beta_0 + \beta_1 EG + \beta_2 RG + \beta_3 MT + \beta_4 LD + \beta_5 UG + e$$

Where,

JS = Job satisfaction

ENG = Employee engagement

EG = Enjoying in gaming

RG = Recognition through gaming

|    |                            |
|----|----------------------------|
| MT | = Motivation               |
| LD | = Learning and development |
| UG | = Usefulness of gaming     |

Enjoying in gaming 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 my job enjoyable because extra activities/games are played every once or twice a year”, “Enjoyable work is more important than a good salary” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.878$ ).

Motivation was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “Once a year, my banks promote motivational games such as quiz related to organization goal”, “Employee are motivated by the gaming activities played in the organization” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.890$ ).

Learning and development was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include “My organization support me in exploring my professional interest and goal”, “I am satisfied with the unique learning practices organized by my organization” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.925$ ).

Recognition through gaming 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 “Employees are recognized fairly at our organization”, “Employee are encouraged to participate in the gaming programs” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.906$ ).

Usefulness of gaming 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 is challenging and gives me a sense of responsibility”, “I work because I find my work valuable and interesting” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.876$ ).

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 satisfied with the amount of training I receive on the job”, “I am satisfied with the culture of my workplace” and so on. The reliability of the items was measured by computing the Cronbach’s alpha ( $\alpha = 0.918$ ).

Employee engagement 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 “At my job, I always stick even when things do not go well”, “My job role makes good use of my skills and abilities” 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.

## Enjoyment of gaming

Shujat and Ameer (2011) asserted that fun-filled activities not only result in better interpersonal relationships but also lighten up the traditional work environment while making workplace comfortable and a less stressful place. These activities may bring a positive change in job satisfaction level. Likewise, Muceldili and Erdil (2016) asserted the positive effects of workplace fun on job satisfaction. Likewise, Robson et al. (2015) found that there is a positive relationship between informal fun activities i.e., manager support and co-worker socialization and extra role behavior with job satisfaction and employee engagement. In addition, Mohtashami et al. (2020) found that people enjoy using a gamified service or system. Moreover, Hanus and Fox (2015) asserted that if an employee enjoys the gamified HRM system and finds it pleasant, exciting, or interesting, it is likely that it enhances job satisfaction. Based on it, this study develops the following hypothesis:

H<sub>1</sub>: There is a positive relationship of enjoyment of gaming with employee engagement and job satisfaction.

## Recognition through gaming

Silic et al. (2020) revealed that an employee's perception of the recognition they receive in a gamified HRM system is positively associated with reciprocal benefits. An employee's perception of a reciprocal benefit in the gamified HRM system is positively associated with job satisfaction. Similarly, Cialdini and Goldstein (2004) found that there is significant positive relationship between valued/recognized gaming and employee engagement. Likewise, Hamari (2017) showed that receiving recognition has a positive impact on reciprocal behavior and employee engagement. In addition, Cruz et al. (2022) revealed that the high rate of recognition significantly influences the employee engagement. Moreover, Andrew and Sofian (2012) found that high recognition rate positive impact on employee engagement. Based on it, this study develops the following hypothesis:

H<sub>2</sub>: There is a positive relationship of recognition through gaming with employee engagement and job satisfaction.

## Motivation

Motivation refers to the stimulus required for an employee to take part in the gamified HR system (Vallerand, 1997). De Lange et al. (2010) stated that there is a positive relationship between motivation and job engagement and self-determined motivation leads to positive outcomes. Likewise, Hanus and Fox (2015) showed that employees are highly motivated to use the gamified HRM system, it contributes to higher levels of job engagement. Similarly, Vorina et al. (2017) showed that motivation as a decision-making process through which the individual chooses desired outcomes has positive impact on job satisfaction. Moreover, Varma (2017) stated that motivated employees have positive effect on the organization productivity and job satisfaction. Furthermore, Octaviannand et al. (2017) stated that work motivation has significant positive effect on job satisfaction. Based on it, this study develops the following hypothesis:

H<sub>3</sub>: There is a positive relationship of motivation with employee engagement and job satisfaction.

## Learning and development

Learning and development are the gradual process of developing the capacity and increasing the knowledge of the particular areas that gives the quality of performance by the employee while completing the task (Edmondson et al., 2007). Chaudhary and Sharma (2012) found that a strong positive correlation of learning and development with job satisfaction. Likewise, Imran and Tanveer (2015) showed that learning courses have positive impact on job satisfaction which help employees to fulfill their responsibilities in an efficient mode. Similarly, Khalid and Khalid (2015) stated that learning experience has a positive effect on job satisfaction. Arifin et al. (2019) stated that learning and development have a positive influence on job satisfaction. Moreover, Anwar and Shukur (2015) stated that the training and development have a positive impact on job satisfaction in private banks in Erbil. In addition, He et al. (2017) found that learning is positively related to affective commitment and employee perceived service quality. Based on it, this study develops the following hypothesis:

H<sub>4</sub>: There is a positive relationship of learning and development with employee engagement and job satisfaction.

## Usefulness in gaming

The usefulness of gaming represents the degree of belief in performance improvement due to gamified system (Panagiotarou et al., 2020). Hollig et al. (2020) stated that gamification usefulness has a significant and positive effect on employee engagement. Silic et al. (2020) found that an employee's perceived usefulness of the gamified HRM system is positively associated with performance expectancy. Alcivar and Abad (2016) showed that usefulness of gaming has a positive impact on employee engagement. Yang et al. (2017) revealed that gamified system's usefulness (communication, familiarity, and acknowledgment) has significant influence on engagement. Koivisto and Hamari (2014) found that there is positive impact of gamification usefulness on job engagement if the gamified HRM system is easy to use. Based on it, this study develops the following hypothesis:

H<sub>5</sub>: There is a positive relationship of gaming usefulness with employee engagement 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 correlation coefficients between dependent variable and independent variables. The correlation coefficients are based on 146 observations. The dependent variable are JS (Job satisfaction) and ENG (Employee engagement). The independent variables are EG (Enjoyment in gaming), RG (Recognition through gaming), MT (Motivation), LD (Learning and development) and UG (Usefulness in gaming).

| Variables | Mean   | SD    | JS      | JE      | EG      | RG      | MT      | LD      | UG |
|-----------|--------|-------|---------|---------|---------|---------|---------|---------|----|
| JS        | 3.7014 | 0.980 | 1       |         |         |         |         |         |    |
| JE        | 3.4932 | 0.981 | 0.604** | 1       |         |         |         |         |    |
| EG        | 3.4877 | 0.957 | 0.496** | 0.517** | 1       |         |         |         |    |
| RG        | 3.6123 | 0.946 | 0.586** | 0.610** | 0.591** | 1       |         |         |    |
| MT        | 3.6644 | 0.935 | 0.555*  | 0.560** | 0.633** | 0.716** | 1       |         |    |
| LD        | 3.6438 | 0.914 | 0.536** | 0.555** | 0.584** | 0.611** | 0.614** | 1       |    |
| UG        | 3.5753 | 0.927 | 0.601** | 0.637** | 0.575** | 0.657** | 0.629** | 0.622** | 1  |

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

Table 1 shows that enjoyment in gaming is positively correlated to job satisfaction. It implies that better enjoyment in gaming leads to increase in the level of job satisfaction. The result also reveals that recognition through gaming is positively correlated to job satisfaction. It implies that better recognition through gaming in the organization leads to increase in job satisfaction. Moreover, motivation is also positively correlated to job satisfaction. It implies that higher the level of motivation, higher would be the employee job satisfaction. Furthermore, learning and development are positively correlated to job satisfaction indicating better learning and development leads to increase in job satisfaction. Similarly, the result also shows that usefulness in gaming is positively correlated to job satisfaction in the organization. It indicates that increase in usefulness in gaming leads to increase in the level of job satisfaction.

On other hand, the result also shows that enjoyment in gaming is positively correlated to employee engagement. It implies that better enjoyment in gaming leads to increase in employee engagement. The result also reveals that recognition through gaming is positively correlated to employee engagement. It implies that better recognition through gaming in the organization leads to increase in employee engagement. Moreover, motivation is also positively correlated to employee engagement. It implies that higher the level of motivation, higher would be the employee engagement. Furthermore, learning and development are positively correlated to employee engagement indicating better learning and development leads to increase in employee engagement. Similarly, the result also shows that usefulness in gaming is positively correlated to employee engagement in the organization. It indicates that increase in usefulness in gaming leads to increase in employee engagement.

## 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 enjoyment of gaming, recognition through gaming, motivation, learning and development, usefulness in gaming on job satisfaction in Nepalese commercial banks.

**Table 2:** Estimated regression results of enjoyment of gaming, recognition through gaming, motivation, learning and development, usefulness in gaming on job satisfaction

The results are based on 146 observations using linear regression model. The model is  $JS = \beta_0 + \beta_1 EG + \beta_2 RG + \beta_3 MT + \beta_4 LD + \beta_5 UG + e$ , where the dependent variable is JS (Job satisfaction). The independent variables are EG (Enjoyment in gaming), RG (Recognition through gaming), MT (Motivation), LD (Learning and development) and UG (Usefulness in gaming).

| Model | Intercept         | Regression coefficients of |                     |                     |                     |                     | Adj. R <sub>bar</sub> <sup>2</sup> | SEE   | F- value |
|-------|-------------------|----------------------------|---------------------|---------------------|---------------------|---------------------|------------------------------------|-------|----------|
|       |                   | EG                         | RG                  | MT                  | LD                  | UG                  |                                    |       |          |
| 1     | 0.801<br>(3.350)  | 0.750<br>(12.008)**        |                     |                     |                     |                     | 0.497                              | 0.737 | 144.187  |
| 2     | 0.661<br>(3.472)  |                            | 0.834<br>(15.912)** |                     |                     |                     | 0.635                              | 0.279 | 253.192  |
| 3     | 0.759<br>(3.574)  |                            |                     | 0.808<br>(13.767)** |                     |                     | 0.565                              | 0.685 | 189.536  |
| 4     | 0.732<br>(3.746)  |                            |                     |                     | 0.787<br>(15.137)** |                     | 0.611                              | 0.647 | 229.142  |
| 5     | 0.360<br>(1.674)  |                            |                     |                     |                     | 0.878<br>(15.451)** | 0.621                              | 0.639 | 238721   |
| 6     | 0.491<br>(2.391)* | 0.187<br>(2.391)*          | 0.685<br>(7.751)**  |                     |                     |                     | 0.643                              | 0.620 | 131.709  |
| 7     | 0.444<br>(2.157)* | 0.131<br>(1.374)           | 0.564<br>(4.938)**  | 0.194<br>(1.655)    |                     |                     | 0.574                              | 0.616 | 115.974  |
| 8     | 0.371<br>(1.878)  | 0.036<br>(0.384)           | 0.430<br>(0.384)    | 0.080<br>(3.756)**  | 0.357<br>(3.839)**  |                     | 0.679                              | 0.589 | 77.542   |
| 9     | 0.191<br>(0.958)  | 0.015<br>(0.163)           | 0.336<br>(2.918)**  | 0.310<br>(0.271)    | 0.267<br>(2.818)**  | 0.327<br>(3.153)**  | 0.698                              | 0.571 | 67.956   |

**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.
- Job satisfaction is the dependent variable.

The regression results shows that the beta coefficients for enjoyment of gaming are positive with job satisfaction. It indicates that enjoyment of gaming has a positive impact on job satisfaction. This finding is similar to the findings of Robson et al. (2015). Likewise, the beta coefficients for recognition through gaming are positive with job satisfaction. It indicates that recognition through gaming has a positive impact on job satisfaction. This finding is consistent with the findings of Andrew and Sofian (2012). Moreover, the beta coefficients for motivation are positive with job satisfaction. It indicates that motivation has a positive impact on job satisfaction. This finding is similar to the findings of Hanus and Fox (2015). Furthermore, the beta coefficients for learning and development are positive with job satisfaction. It indicates that usefulness in gaming has a positive impact on job satisfaction. This finding is consistent with the findings of Khalid and Khalid (2015). Similarly, the beta coefficients for usefulness in gaming are positive with job satisfaction. It indicates that usefulness in gaming has a positive impact on job satisfaction. This finding is similar to the findings of Koivisto and Hamari (2014).



Table 3 shows the estimated regression results of enjoyment of gaming, recognition through gaming, motivation, learning and development, usefulness in gaming on employee engagement in Nepalese commercial banks.

**Table 3:** Estimated regression results of enjoyment of gaming, recognition through gaming, motivation, learning and development, usefulness in gaming on employee engagement

The results are based on 146 observations using linear regression model. The model is  $ENG = \beta_0 + \beta_1 EG + \beta_2 RG + \beta_3 MT + \beta_4 LD + \beta_5 UG + e$ , where the dependent variable is ENG (Employee engagement). The independent variables are EG (Enjoyment in gaming), RG (Recognition through gaming), MT (Motivation), LD (Learning and development) and UG (Usefulness in gaming).

| Model | Intercept          | Regression coefficients of |                     |                     |                     |                     | Adj. R <sup>2</sup> | SEE   | F- value |
|-------|--------------------|----------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------|----------|
|       |                    | EG                         | RG                  | MT                  | LD                  | UG                  |                     |       |          |
| 1     | 1.094<br>(5.454)** | 0.689<br>(13.153)**        |                     |                     |                     |                     | 0.543               | 0.618 | 172.995  |
| 2     | 1.112<br>(6.493)** |                            | 0.725<br>(15.371)** |                     |                     |                     | 0.619               | 0.564 | 236.273  |
| 3     | 1.208<br>(6.324)** |                            |                     | 0.699<br>(13.239)** |                     |                     | 0.546               | 0.616 | 175.263  |
| 4     | 1.177<br>(6.697)** |                            |                     |                     | 0.683<br>(14.604)** |                     | 0.594               | 0.582 | 213.268  |
| 5     | 0.517<br>(3.436)** |                            |                     |                     |                     | 0.853<br>(21.436)** | 0.760               | 0.448 | 459.518  |
| 6     | 0.864<br>(4.801)** | 0.272<br>(3.459)**         | 0.508<br>(6.550)**  |                     |                     |                     | 0.651               | 0.544 | 133.114  |
| 7     | 0.840<br>(4.625)** | 0.244<br>(2.895)**         | 0.446<br>(4.426)**  | 0.098<br>(0.952)    |                     |                     | 0.645               | 0.548 | 88.986   |
| 8     | 0.784<br>(4.442)** | 0.170<br>(2.024)*          | 0.343<br>(3.352)**  | 0.010<br>(0.101)    | 0.275<br>(3.314)**  |                     | 0.669               | 0.526 | 74.175   |
| 9     | 0.433<br>(2.836)** | 0.070<br>(0.989)           | 0.158<br>(1.801)    | 0.085<br>(0.987)    | 0.099<br>(1.364)    | 0.639<br>(8.071)**  | 0.772               | 0.436 | 99.362   |

**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 engagement is the dependent variable.

The regression results shows that the beta coefficients for enjoyment of gaming are positive with employee engagement. It indicates that enjoyment of gaming has a positive impact on employee engagement. This finding is similar to the findings of Shujat and Ameer (2011). Likewise, the beta coefficients for recognition through gaming are positive with employee engagement. It indicates that recognition through gaming has a positive impact on employee engagement. This finding is consistent with the findings of Cialdini and Goldstein (2004). Moreover, the beta coefficients for motivation are positive with employee engagement. It indicates that motivation has a positive impact on employee engagement. This finding is similar to the findings of Vorina et al. (2017). Furthermore, the beta coefficients for learning and development are positive with employee engagement. It indicates that usefulness in gaming has a positive impact on employee engagement. This finding is consistent with the findings of Chaudhary and Sharma (2012).

Similarly, the beta coefficients for usefulness in gaming are positive with employee engagement. It indicates that usefulness in gaming has a positive impact on employee engagement. This finding is similar to the findings of Alcivar and Abad (2016).

## 4. Summary and conclusion

Every organization must adopt unique activities in terms of gamified human resource management system for high job satisfaction and engagement within the internal organization. Highly satisfied employees tend to have better physical and mental health, learn the new job related tasks easily, and have less job stress and unrest. Such employees will become more co-operative such as helping co-workers, helping customers etc. Engaged workers are often the strongest performers and go above and beyond their job description. This leads to an increase in employee productivity and project success. Thus, keeping employee satisfaction and engage in their jobs should be a foremost priority for every organization.

This study attempts to examine the effect of gamified human resource management system on job satisfaction and employee engagement in Nepalese commercial banks. The study is based on primary data with 146 observations.

The study showed that enjoyment of gaming, recognition through gaming, motivation, learning and development and usefulness in gaming on employee job satisfaction and engagement. The study concluded that motivation followed by usefulness in gaming are the most influencing factors that explain the changes in employee job satisfaction in Nepalese commercial banks. The study also concluded that usefulness in gaming followed by recognition through gaming are the most influencing factors that explain the changes in employee engagement in Nepalese commercial banks.

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