Effect of Bank Specific Factors and Market Structure Factors on Profitability in Nepalese Commercial Banks

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Abstract

This study examines the effect of bank specific factors and market structure factors on the profitability of Nepalese commercial banks. Return on assets (ROA) and net interest margin (NIM) are the selected dependent variables. The selected independent variables are bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share, and market capitalization. The study is based on secondary data of 14 commercial banks with 112 observations for the study period from 2015/16 to 2022/23. The data were 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 bank specific factor and market structure factors on the profitability of Nepalese commercial banks.

The study showed that non-performing loan has a negative impact on return on assets and net interest margin. It indicates that increase in non-performing loan leads to decrease in return on assets and net interest margin. Similarly, capital adequacy ratio has a positive impact on return on assets and net interest margin. It indicates that increase in capital adequacy ratio leads to increase in return on assets and net interest margin. In contrast, loan to deposit ratio has a negative impact on return on assets and net interest margin. It indicates that increase on loan to deposit ratio leads to decrease in return on assets and net interest margin. Further, operating efficiency has a negative impact on return on assets. It indicates that increase in operating efficiency leads to decrease in return on assets. In addition, 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. Moreover, market capitalization has a positive impact on return on assets. It indicates that increase in market capitalization leads to increase in return on assets. Similarly, book value per share has a positive impact on return on assets and net interest margin. It indicates that higher the book value per share, higher would be the return on assets and net interest margin.

Keywords: return on assets, net interest margin, bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share, market capitalization

1. Introduction

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

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healthy and sustainable profitability is important in maintaining the stability of the banking system for sustainable growth in general (Tafri *et al.,* 2009). Profitability ensures that banks have sufficient capital reserves to absorb losses and maintain stability, especially during economic downturns or financial crises. This helps prevent bank failures and systemic risks that could destabilize the entire financial system. Profitable banks are better positioned to invest in risk management practices, such as implementing robust credit assessment procedures, maintaining adequate liquidity reserves, and diversifying their asset portfolios. This helps mitigate risks and reduces the likelihood of bank insolvency. The strong profitability of a bank shows a higher capacity to earn profit and bigger contribution to the economic growth (Adiatmayani and Panji, 2021). According to Handriani and Robiyanto (2018), profitability is one of the most important goals of financial management besides maximizing the owner's wealth. In the banking industries, profitability is considered as the most accurate indicator to measure the bank performance using instruments, such as return on assets (ROA) and net interest margin (NIM). According to Cuac *et al.* (2020), operational costs to operational income (BOPO) measures the level of a bank's ability to operate. Liquidity risk basically originates due to the weak deposit base of a bank. Fahrul and Rusliati (2016) showed that operational risk and liquidity risk have significant effect on the profitability of banks. A healthy and sustainable profitability is essential for the stability, resilience, and continued functioning of the banking system, supporting economic growth and prosperity.

Adequate capital provides a buffer against unexpected losses. Banks with higher levels of capital can absorb losses from non-performing loans, market volatility, or operational failures without jeopardizing their solvency. This allows them to maintain stability and confidence among investors and depositors. Witjaksono and Natakusumah (2020) examined the effect of third-party funds, capital adequacy ratio, non-performing financing, operational expenses and operational income (BOPO) on the profitability of Sharia banks. The study showed that capital adequacy and the comparison of operating expenses to operating income have a significant impact on profitability. Similarly, Arasy and Sri (2020) stated that capital adequate provide a protection against the insolvency and liquidation arising from the risks that the bank is facing. The higher the CAR, the more flexible the bank is to place funds in risky productive assets. The higher the CAR reflects the greater the capital owned by the bank so that it affects the level of public trust which leads to an increase in bank profits (Sari and Endri, 2019). Likewise, Al-Sharkas (2022) analyzed the impact of capital adequacy ratios on bank

profitability in a Jordanian. The study found that return on assets is negatively correlated with capital adequacy ratios. Further, Spaseska *et al.* (2022) investigated the impact of capital adequacy ratio on banks' profitability in the Republic of North Macedonia. The study found that there is a positive relationship between capital adequacy ratio (CAR) and return on average assets (ROA). In addition, Gupta and Mahakud (2020) assessed the ownership, bank size, capitalization and bank performance: An evidence from India. The study revealed that private sector banks are more profitable than the public sector banks. Moreover, Hasmiana and Pintor (2022) examined the effect of financial risk, capital structure, banking liquidity on profitability: Operational efficiency as intervening variables in Persero bank and private commercial banks. The study concluded that increase in non-performing loan interrupts and decline in lending to the public and consequently affect the bank's profitability. Similarly, Do *et al.* (2020) analyzed the effect of non-performing loan on profitability of commercial bank of Vietnam. The study found that non-performing loans have negative impact on bank's profitability. Likewise, Psaila *et al.* (2019) analyzed the impact of NPLs on listed commercial bank's profitability. The result revealed that there is a negative impact of non-performing loans on return on assets. Further, Oudat and Ali (2020) examined the effect of bad debt, market capitalization, operation cost, capital adequacy, cash reserves on financial performance. The result revealed that there is an insignificant relationship between market capitalization and profitability.

Capital adequacy is a critical determinant of a bank's profitability, as it influences risk management practices, regulatory compliance, borrowing costs, lending capacity, investor confidence, and competitive positioning. Maintaining an optimal capital structure is essential for banks to achieve sustainable profitability while ensuring financial stability. Sushmitha and Nagaraja (2020) examined the non-performing assets management in the co-operative banks in India: A descriptive analysis. The study identified that mounting amount of non-performing assets is creating a huge disturbance in the economic operation of the Indian banking industry. Similarly, Messai and Jouini (2013) stated that non-performing loans are among the main causes of the problems of economic stagnation. The large amount of non-performing loans in the banking system generally results in a bank failure. The importance of non-performing loans (NPL) is ambiguous as banks fear that their lending behavior will suffer disadvantages and if an increase in NPLs exceeds expected levels, this will impact negatively on the bank profitability (Banker *et al.,* 2010). Likewise, Olweny and Shipho (2011) analyzed the effects of banking sectorial factors on the profitability of commercial banks

in Kenya. The study showed that the bank-specific factors are the most significant factors influencing the profitability of commercial banks in Kenya than market factors. The study also revealed that profitable commercial banks are those that strive to improve their capital bases, reduced operational costs, improve assets quality by reducing the rate of non-performing loans, employ revenue diversification strategies as opposed to focused strategies and keep the right amount of liquid assets. Further, Mahmud *et al.* (2016) assessed the bank-specific factors affecting the profitability of commercial banks in Bangladesh. The study showed that bank size, capital adequacy, operating expense ratio and gearing ratio (risk) are found to be statistically significant. However, bank size, operating expense ratio and gearing ratio (risk) affect the bank profitability negatively and capital adequacy ratio has a positive impact on bank's profitability.

Hadian (2021) examined the effect of non-performing loans and loan to deposit ratio on return on assets in the banking industry. The study revealed that non-performing loan has a negative impact on return on assets. Similarly, loan to deposit ratio has a positive and significant impact on return on assets. Similarly, Lawati (2021) examined the effect of loan to deposit ratio and debt to equity ratio on return on equity. The results showed that loan to deposit ratio has a positive and significant impact on return on equity. In addition, Brastama and Yadnya (2020) analyzed the effect of capital adequacy ratio and non-performing loan on banking stock prices with performance as intervening variable. The results stated that capital adequacy ratio has a positive impact on return on assets. Similarly, the non-performing loan has a negative impact on return on assets. Moreover, Sukmadewi (2020) examined the effect of capital adequacy ratio, loan to deposit ratio, operating-income ratio, non-performing loans, and net interest margin on banking financial performance. The results revealed that capital adequacy ratio, non-performing loan, and loan to deposit ratio have positive and significant impact on return on assets. Similarly, Solihati (2020) analyzed the factors affecting banking performance. The results revealed that non-performing loan and capital adequacy ratio have significant impact on return on assets (ROA). Meanwhile, non-performing loan has a significant and negative impact on return on assets (ROA) and capital adequacy ratio is not significantly affected by return on assets (ROA). Moreover, Utu (2019) examined non-performing loan, net interest margin, and loan to deposit ratio as well as their effects on return on asset in bank Sultra. The results revealed that non-performing loan (NPL) and loan to deposit ratio (LDR) have positive and significant impact on return on assets (ROA).

Ramadhanti *et al.* (2019) examined the effect of capital adequacy, liquidity and credit risk on the performance of commercial banks. The study revealed that capital adequacy ratio (CAR) has a significant positive impact on performance. Similarly, non-performing loan (NPL) has a negative and significant impact on financial performance. Similarly, Rajindra *et al.* (2021) examined the effect of costs and operational revenue and loan to deposit ratio on return on assets in the context of Indonesia. The study found that operational costs, operational income, and loan to deposit ratio have significant impact on ROA. Similarly, operational costs and operational income have significant negative impact on return on assets. Moreover, Setiawan and Nupus (2021) analyzed the effect of capital adequacy ratio and loan to deposit ratio on banking performance. The result found that capital adequacy ratio (CAR) and loan to deposit ratio (LDR) have positive and significant influence on the performance in State Owned Banks. However, asset size has a positive and significant impact on performance in foreign bank. Likewise, Agustiningrum (2013) analyzed the impacts of non-performing loans (NPL) and loan to deposit ratio (LDR) towards performance. The study showed that loan to deposit ratio has a positive and significant impact on performance. In contrast, Ahmad *et al*. (2012) revealed that loan to deposit ratio has a negative and significant impact on the performance.

In the context of Nepal, Shrestha and Chaurasiya (2023) examined the impact of liquidity management and profitability of joint venture commercial banks in Nepal. The result showed that there is an insignificant impact of credit to deposit ratio, capital adequacy ratio, and cash reserve ratio on return on assets of joint venture commercial banks in Nepal. Similarly, Pradhan and Parajuli (2017) analyzed the effect of capital adequacy and cost income ratio on the performance of Nepalese commercial banks. The study showed that capital adequacy ratio, cost income ratio, equity capital to total assets ratio and liquidity ratio have significant impact on profitability measured by return on assets. Likewise, Gnawali (2018) assessed the non-performing asset and its effects on profitability of Nepalese commercial banks. The study found that there is a negative impact of non-performing loan on return on assets in context of Nepalese government banks. In contrast, non-performing loan to total loan has a negative impact on firm profitability. Further, Chalise (2019) examined the impact of capital adequacy and cost-income ratio on performance of Nepalese commercial banks. The study revealed that cost-income ratio has a negative but significant impact on banks performance and total capital adequacy has a negative and an insignificant impact with bank performance (ROA). In addition, Singh *et al.* (2021) investigated the effect

of non-performing loan on profitability in case of empirical evidence from Nepalese commercial banks. The study concluded that non-performing loans have negative impact on profitability. Moreover, Panta (2018) investigated the bank-specific and macroeconomic determinants of non-performing loans as well as its impact on profitability. The study revealed that non-performing loan and bank size have negative and significant impact on return on assets.

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

The major objective of the study is to examine the effect of bank specific factors and market structure factors on profitability in Nepalese commercial banks. Specifically, it examines the relationship of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share, and market capitalization with profitability of Nepalese commercial banks.

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

2. Methodological aspects

The study is based on the secondary data which were collected from 14 Nepalese commercial banks for the study period from 2015/16 to 2022/23, leading to a total of 112 observations. The study employed stratified sampling method. Strata was formed on the basis of ownership structure. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

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

S. N.	Name of the banks	Study period	Observations
Public banks			
1	Rastriya Banijya Bank Limited	2015/16-2022/23	8
2	Agricultural Development Bank Limited	2015/16-2022/23	8
3	Nepal Bank Limited	2015/16-2022/23	8
Joint venture banks			
4	Everest Bank Limited	2015/16-2022/23	8
5	NMB Bank Limited	2015/16-2022/23	8
6	Standard Chartered Bank Nepal Limited	2015/16-2022/23	8
Private banks			
7	Siddhartha Bank Limited	2015/16-2022/23	8
8	Citizens Bank International Limited	2015/16-2022/23	8
9	Prime Commercial Bank Limited	2015/16-2022/23	8
10	NIC Asia Bank Limited	2015/16-2022/23	8
11	Nepal SBI Bank Limited	2015/16-2022/23	8
12	Sanima Bank Limited	2015/16-2022/23	8
13	Himalayan Bank Limited	2015/16-2022/23	8
14	Machhapuchchhre Bank Limited	2015/16-2022/23	8
Total number of observations			**112**

Thus, the study is based on 112 observations.

The model

The model used in this study assumes that profitability depends upon bank specific factors and market structure factors. The dependent variables selected for the study are return on assets and net interest margin. Similarly, the selected independent variables are bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share, and market capitalization. Therefore, the models take the following forms:

$$ROA = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 BS + \beta_5 OE + \beta_6 BVPS + \beta_7 MC + e_{it}$$

$$NIM = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 BS + \beta_5 OE + \beta_6 BVPS + \beta_7 MC + e_{it}$$

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.

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

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

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

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

OE = Operating efficiency as measured by operational expenses to operational income, in percentage.

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

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

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

Bank size

Larger banks typically benefit from economies of scale, which means they can spread their fixed costs over a larger asset base. This can lead to lower average costs per unit of output, including the cost of providing banking services. As a result, larger banks may achieve higher profit margins compared to smaller banks. Sahyouni and Wang (2018) examined the determinants of bank profitability. The study found that bank size is positively correlated to profitability of banks. Similarly, Chhaidar *et al.* (2022) analyzed the effect of financial technology investment level on European banks' profitability. The study showed that bank size is positively correlated to European bank's profitability. However, Akbas (2012) assessed the determinants of bank profitability: An investigation on Turkish banking sector. The study concluded that bank size is negatively correlated to profitability measured by return on assets and return on equity. Further, Eyigege (2018) analyzed the influence of firm size on financial performance of deposit money banks quoted on the Nigeria Stock Exchange. The study found that firm size has an insignificant and negative impact on financial performance. Based on it, this study develops

the following hypothesis:

H_1: There is a positive relationship between bank size and bank's profitability.

Non-performing loan

Non-performing loans represent loans where the borrower has stopped making payments or where there are doubts about the borrower's ability to repay the loan. When loans become non-performing, banks may need to set aside provisions to cover potential credit losses. This reduces the bank's net income and profitability. Collaku and Aliu (2021) examined the impact of non-performing loans on bank's profitability: Empirical evidence from commercial Banks in Kosovo. The study showed a significant but negative relationship between non-performing loan and profitability as measured by return on assets. Similarly, Dewi and Badjra (2020) assessed the effect of NPL, LDR and operational cost of operational income on ROA. The study revealed that non-performing loan is negatively correlated to profitability. However, Afriyie and Akotey (2012) found a positive relationship between non-performing loans and bank profitability. Further, Maseke (2021) analyzed the risk management impact on non-performing loans and profitability in the Namibian banking sector. The study found that there is a negative relationship between non-performing loan and profitability. Moreover, Uddin (2022) examined the effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. The study revealed that non-performing loan has a negative impact on profitability. Based on it, this study develops the following hypothesis:

H_2: There is a negative relationship between non-performing loan and bank's profitability.

Capital adequacy ratio

Banks with higher capital adequacy ratios are better positioned to absorb unexpected losses, whether from non-performing loans, market volatility, or operational failures. This enhanced resilience can lead to greater stability and confidence among investors, depositors, and regulators, which can positively impact profitability. Kulsum *et al*. (2023) examined the analysis of capital adequacy ratio (CAR), non-performing financing (NPF) and financing to deposit ratio (FDR) to profitability return on assets (ROA). The study found that capital adequacy ratio has a significant and positive impact on return on assets. Similarly, Abiodun *et al.* (2020) found that capital adequacy ratio has a significant and strong positive relationship with the profitability of the bank.

Banks with higher capital adequacy ratios may have a competitive advantage over their peers. They may be better positioned to pursue growth opportunities, expand market share, or weather economic downturns, which can contribute to enhanced profitability and shareholder value. Likewise, Singh and Milan (2023) found that capital adequacy ratio is positively correlated with bank's performance, but inversely related with bank's interest margin. Based on it, this study develops the following hypothesis:

H_3: There is a positive relationship between capital adequacy ratio and bank's profitability.

Loan to deposit ratio

A higher loan-to-deposit ratio implies that the bank is lending out a larger portion of its deposits. While lending generates interest income for the bank, it also exposes the bank to higher credit risk. If the loans are performing well and generating sufficient interest income, a higher LDR can positively impact profitability. However, if a significant portion of loans turns non-performing, it can lead to increased provisions for credit losses, which may erode profitability. Astuti *et al.* (2023) examined the influence of capital adequacy ratio and loan to deposit ratio on return on asset at PT bank Mandiri. The study found that loan to deposit ratio has a significant positive impact on return on assets. Similarly, Gurung and Gurung (2022) revealed that loan to deposit has a significant positive impact on return on assets and net interest margin. Likewise, Kalimashi *et al.* (2022) found that loan to deposit ratio has a positive impact on return on assets and negative impact on net interest margin. Based on it, this study develops the following hypothesis:

H_4: There is a positive relationship between loan to deposit ratio and bank's profitability.

Operational efficiency

Operational inefficiencies often result in higher operating costs for banks. This could include expenses related to manual processes, redundant systems, outdated technology, or inefficiencies in resource allocation. Higher operating costs reduce the bank's net income, which negatively impacts profitability. Anggraeni *et al*. (2022) examined the factors influencing on bank capital and profitability: Evidence of government banks in Indonesia. The study found that operational efficiency ratio has a significant but negative impact on profitability. Similarly, Adam *et al*. (2018) showed that operational efficiency has a negative impact on profitability. However, Sufian (2011)

assessed the Profitability of the Korean banking sector: Panel evidence on bank specific and macroeconomics determinants. The study concluded that operating efficiency ratio has a positive impact on profitability of Korean banking system. Based on it, this study develops the following hypothesis:

H_5: There is a negative relationship between operational efficiency and bank's profitability.

Book value per share

Book value per share (BVPS) is a financial metric that represents the total equity of a company divided by the number of outstanding shares. Akbar (2021) examined the determinants of net interest margin on conventional banking: Evidence in Indonesia stock exchange. The study showed a positive relationship between return on assets, return on equity and price to book value on banking companies listed on the Indonesia Stock Exchange. Similarly, Ulzanah and Murtaqi (2015) revealed that book value per share has a positive and significant impact towards profitability measured by return on assets. Likewise, Indriawati (2018) showed that book value per share have no influence on profitability of banks. Further, Nugroho (2020) found that book value per share has a significant and positive impact on return on assets. In addition, Sihotang and Munir (2021) found that price to book value (PBV) ratio has a significant impact on profitability. Based on it, this study develops the following hypothesis:

H_6: There is a positive relationship between book value per share and bank's profitability.

Market capitalization

Market capitalization refers to value of a company's outstanding shares of stock, calculated by multiplying the current market price per share by the total number of outstanding shares. Almumani (2018) examined the effect of profitability ratios and market value ratios on market capitalization of commercial banks in Jordan. The study found that there is a positive relationship between market capitalization and profitability. Similarly, Prasad and Shrimal (2015) revealed that there is a positive relationship between market capitalization and profitability. Likewise, Qurashi and Zahoor (2016) showed that market capitalization has a positive impact on return on investment. Based on it, this study develops the following hypothesis:

H_7: There is a negative relationship between market capitalization and bank's profitability.

3. Results and discussion

Descriptive statistics

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

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 14 Nepalese commercial banks for the study period of 2015/16 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by total assets, Rs. in billion), OE (Operating efficiency as measured by operational expenses to operational income, in percentage), MC (Market capitalization as measured by the product of market price per share to number of share outstanding, Rs. in billion) and BVPS (Book value per share as measured by the total equity divided by number of shares outstanding in Rs).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	2.79	1.55	0.48
NIM	1.87	5.60	3.14	0.68
NPL	0.01	4.93	1.46	1.30
CAR	10.20	22.99	14.12	2.37
LDR	56.88	107.01	84.83	8.38
OE	20.35	59.03	40.82	7.782
BS	49.95	827.81	202.01	163.27
MC	16.84	288.41	48.34	42.67
BVPS	121.00	499.97	209.01	92.76

Source: SPSS output

Correlation analysis

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

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficient matrix of dependent and

independent variables of 14 Nepalese commercial banks for the study period from 2015/16 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by total assets, Rs. in billion), OE (Operating efficiency as measured by operational expenses to operational income, in percentage), MC (Market capitalization as measured by the product of market price per share to number of share outstanding, Rs. in billion) and BVPS (Book value per share as measured by the total equity divided by number of shares outstanding in Rs).

Variables	ROA	NIM	NPL	CAR	LDR	OE	BS	MC	BVPS
ROA	1								
NIM	0.523**	1							
NPL	-0.017	-0.446**	1						
CAR	0.338**	0.351**	-0.025	1					
LDR	-0.207*	-0.068	-0.133	-0.054	1				
OE	-0.302**	0.075	0.162	-0.008	0.134	1			
BS	0.020	-0.039	-0.055	0.427**	-0.442**	-0.091	1		
MC	0.044	-0.236*	-0.160	0.055	-0.344**	-0.202*	0.289**	1	
BVPS	0.214*	0.180	0.142	0.156	-0.264**	0.107	0.083	0.093	1

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 has a negative relationship with return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. Similarly, capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In contrast, loan to deposit ratio has a negative relationship with return on assets. It indicates that increase on loan to deposit ratio leads to decrease in return on assets. Further, operating efficiency has a negative relationship with return on assets. It indicates that increase in operating efficiency leads to decrease in return on assets. In addition, bank size has a positive relationship with return on assets. It indicates that increase in bank size leads to increase in return on assets. Moreover, market capitalization has a positive relationship with return on assets. It indicates that increase in market capitalization leads to increase in return on assets. Similarly, book value per share has a positive relationship with return on assets. It indicates that higher the book value per share, higher would be the return on assets.

Similarly, non-performing loan has a negative relationship with net

interest margin. It indicates that increase in non-performing loan leads to decrease in net interest margin. Moreover, capital adequacy ratio has a positive relationship with net interest margin. It indicates that increase in capital adequacy ratio leads to increase in net interest margin. In contrast, loan to deposit ratio has a negative relationship with net interest margin. It indicates that increase in loan to deposit ratio leads to decrease in net interest margin. Further, operating efficiency has a positive relationship with net interest margin. It indicates that increase in operating efficiency leads to increase in net interest margin. In addition, bank size has a negative relationship with net interest margin. It indicates that increase in bank size leads to decrease in net interest margin. Moreover, market capitalization has a negative relationship with net interest margin. It indicates that increase in market capitalization leads to decrease in net interest margin. In addition, book value per share has a positive relationship with net interest margin. It indicates that higher the book value per share, higher would be the net interest margin.

Regression analysis

Having indicated Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share, and market capitalization on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share and market capitalization on return on assets of Nepalese commercial banks

The results are based on panel data of 14 commercial banks with 112 observations for the study period from 2015/16 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 BS + \beta_5 OE + \beta_6 BVPS + \beta_7 MC + e_{it}$ where the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by total assets, Rs. in billion), OE (Operating efficiency as measured by operational expenses to operational income, in percentage), MC (Market capitalization as measured by the product of market price per share to number of share outstanding, in Rs.) and BVPS (Book value per share as measured by the total equity divided by number of shares outstanding in Rs).

Model	Intercept	Regression coefficients of							Adj. R_bar^2	SEE	F-value
		NPL	CAR	LDR	OE	BS	MC	BVPS			
1	1.569 (22.476)**	-0.006 (0.182)							0.009	0.489	0.033
2	0.580 (2.195)*		0.069 (3.763)**						0.106	0.460	14.160
3	2.580 (5.580)**			-0.012 (2.218)*					0.034	0.479	4.918
4	2.332 (9.857)**				-0.019 (3.232)**				0.083	0.466	11.044
5	1.548 (20.970)**					0.005 (0.207)			0.009	0.489	0.043
6	1.543 (20.926)**						0.001 (0.445)		0.008	0.496	0.198
7	1.329 (11.284)**							0.001 (2.217)*	0.037	0.485	4.914
8	1.543 (2.968)**		0.067 (3.703)**	-0.011 (2.140)*					0.134	0.453	9.599
9	2.340 (8.735)**				-0.019 (3.083)**		0.001 (0.168)*		0.070	0.476	4.861
10	3.394 (6.102)**	-0.005 (0.164)		-0.012 (2.116)*	-0.018 (3.113)**	0.021 (1.000)			0.103	0.461	5.259
11	3.821 (5.688)**			-0.018 (2.419)*	-0.016 (2.579)**	0.018 (0.917)	-0.001 (0.072)		0.104	0.467	3.994
12	3.302 (4.692)**			-0.013 (1.761)	-0.018 (2.982)**	0.014 (0.787)	-0.001 (0.796)	0.001 (2.123)*	0.135	0.459	4.210

Notes:

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

Table 4 shows that the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Collaku and Aliu (2021). Similarly, the beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is similar to the findings of Kulsum *et al*. (2023). In contrast, the beta coefficient for loan to deposit ratio are negative with return on assets. It indicates that loan to deposit ratio has a negative impact on return on assets. This finding is similar to the findings of Kalimashi *et al.* (2022). Likewise, the beta coefficients for operating efficiency are negative with return on assets. It indicates that operating efficiency has a negative impact on return on assets. This finding is consistent with the findings of Anggraeni *et al*. (2022). Moreover, the beta coefficients for bank size are positive with return on assets. It indicates that bank size has a positive impact on return on assets. This finding is similar to the findings of Sahyouni and Wang (2018). In addition, the beta coefficients for market capitalization are positive with return on assets. It indicates that market capitalization has a positive impact on return on assets. This finding is similar to the findings of Almumani (2018). Further, the beta coefficients for book value per share are positive with return on assets. It indicates that

book value per share has a positive impact on return on assets. This finding is similar to the findings of Nugroho (2020).

Estimated regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share and market on net interest margin of Nepalese commercial banks are presented in Table 5.

Table 5

Estimated regression results of bank size, non-performing loans, capital adequacy ratio, loan-to-deposit ratio, operating efficiency, book value per share and market on net interest margin of Nepalese commercial banks

The results are based on panel data of 14 commercial banks with 112 observations for the study period from 2015/16 to 2022/23 by using the linear regression model and the model is $NIM = \beta_0 + \beta_1 NPL + \beta_2 CAR + \beta_3 LDR + \beta_4 BS + \beta_5 OE + \beta_6 BVPS + \beta_7 MC + e_{it}$ where the dependent variable is NIM (Net interest margin as measured by the ratio of net interest income to total assets, in percentage). The independent variables are NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), LDR (Loan to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), BS (Bank size as measured by total assets, Rs. in billion), OE (Operating efficiency as measured by operational expenses to operational income, in percentage), MC (Market capitalization as measured by the product of market price per share to number of share outstanding, in Rs.) and BVPS (Book value per share as measured by the total equity divided by number of shares outstanding in Rs).

Model	Intercept	Regression coefficients of							Adj. R_bar^2	SEE	F-value
		NPL	CAR	LDR	OE	BS	MC	BVPS			
1	2.804 (32.173)**	-0.232 (5.231)**							0.192	0.611	27.36
2	1.726 (4.701)**		0.101 (3.928)**						0.115	0.639	15.427
3	3.613 (5.493)**			-0.006 (0.714)					0.004	0.681	0.51
4	2.879 (8.339)**				0.007 (0.787)				0.003	0.681	0.62
5	3.178 (30.887)**					-0.156 (0.405)			0.008	0.682	0.164
6	3.296 (34.086)**						-0.004 (2.457)*		0.047	0.65	6.038
7	2.847 (17.802)**							0.001 (1.853)	0.023	0.658	3.433
8	2.075 (2.822)**		0.120 (3.880)**	-0.004 (0.548)					0.109	0.641	7.815
9	3.251 (8.849)**				0.001 (0.128)		-0.004 (2.369)*		0.037	0.654	2.998
10	3.713 (4.508)**	-0.218 (4.621)**		-0.009 (1.078)	0.007 (0.860)	-0.264 (0.771)			0.051	0.683	0.63
11	3.544 (3.744)**			-0.004 (0.375)	0.002 (0.219)	-0.237 (0.228)	-0.004 (2.405)*		0.021	0.659	1.557
12	2.83 (2.850)**			-0.002 (0.221)	0.002 (0.178)	-0.109 (0.372)	-0.004 (2.518)**	0.002 (2.072)**	0.053	0.648	2.146

Notes:

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

Table 5 shows that the beta coefficients for non-performing loan are negative with net interest margin. It indicates that non-performing loan has a negative impact on net interest margin. This finding is consistent with the findings of Dewi and Badjra (2020). 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 Singh and Milan (2023). In contrast, the beta coefficient for loan to deposit ratio are negative with net interest margin. It indicates that loan to deposit ratio has a negative impact on net interest margin. This finding is not similar to the findings of Gurung and Gurung (2022). Likewise, the beta coefficients for operating efficiency are positive with net interest margin. It indicates that operating efficiency has a positive impact on net interest margin. This finding is consistent with the findings of Sufian (2011). Further, the beta coefficients for bank size are negative with net interest margin. It indicates that bank size has a negative impact on net interest margin. This finding is similar to the findings of Eyigege (2018). In addition, the beta coefficients for market capitalization are negative with net interest margin. It indicates that market capitalization has a negative impact on net interest margin. This finding is not similar to the findings of Qurashi and Zahoor (2016). Moreover, the beta coefficients for book value per share are positive with net interest margin. It indicates that book value per share has a positive impact on net interest margin. This finding is similar to the findings of Sihotang and Munir (2021).

4. Summary and conclusion

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

This study attempts to analyze the effect of bank specific factors and market structure factors on profitability in Nepalese commercial banks. The study is based on secondary data of 14 commercial banks with 112

observations for the period from 2015/16 to 2022/23.

The major conclusion of this study is that non-performing loan and loan to deposit ratio have negative impact on return on assets and net interest margin. However, capital adequacy ratio and book value per share have positive impact on return on assets and net interest margin. Higher capital requirements may constrain lending capacity to some extent, banks with adequate capital ratios still have the capacity to extend credit to creditworthy borrowers. Prudent lending practices supported by strong capital levels can lead to sustainable loan growth, interest income, and profitability over the long term. Likewise, operating efficiency has a negative impact on return on assets. Banks with inefficient operations may struggle to compete effectively in the market. Competitors with leaner operations can offer better products, services, and pricing, attracting customers and capturing market share. This can lead to revenue loss and decreased profitability for the less efficient bank. Likewise, the study also concluded that bank size followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on asset in the context of Nepalese commercial banks. Similarly, the study also concluded that capital adequacy ratio followed by book value per share is the most influencing factor that explains the changes in net interest margin in the context of Nepalese commercial banks.

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