

Effect of Base Rate and Spread Rate on Profitability of Nepalese Commercial Banks

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Abstract

This study examines the effect of interest rate spread on profitability of Nepalese commercial banks. Return on assets and Earning per Share are the selected dependent variables. The selected independent variables are capital adequacy ratio, non-performing loan, base rate, spread rate, credit to deposit ratio and inflation. The study is based on secondary data of 19 commercial banks with 209 observations for the study period from 2012/13 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of interest rate spread on profitability of Nepalese commercial banks.

The study showed that capital adequacy ratio has a positive impact on return on assets and earnings per share. It indicates that increase in capital adequacy ratio leads to increase in return on assets and earnings per share. However, non-performing loan has a negative impact on return on assets and earnings per share. It indicates that increase in non-performing loan leads to decrease in return on assets and earnings per share. In contrast, base rate has a positive impact on return on assets and earnings per share. It indicates that higher the base rate, higher would be the return on assets and earnings per share. Likewise, spread rate has a positive impact on return on assets and earnings per share. It indicates that increase in spread rate leads to increase in return on assets and earnings per share. Further, credit to deposit ratio has a positive impact on return on assets and earnings per share. It indicates that increase in credit to deposit ratio leads to increase in return on assets and earnings per share. In contrast, inflation has a negative impact on return on assets and earnings per share. It indicates that higher the inflation rate, lower would be the return on assets and earnings per share.

Keywords: capital adequacy ratio, non-performing loan, spread rate, credit to deposit ratio, base rate, inflation, return on assets and earning per share

1. Introduction

Banks and financial institutions are the backbone of country's economic development. Banks failure and success will have huge impact on financial as well as economic health of overall sectors of country. The health of the financial system has important role in the country as its failure can disrupt economic development of the country. Financial performance is company's ability to generate new resources, from day-to-day operation over a given period and it is gauged by net income and cash from operation. A commercial bank is financial institution which performs the functions of accepting deposits from the public and giving loan for investment with the aim of earning profit. Financial institutions generally trade and commerce with short term loans. The term "profitability" describes a positive return on investment or commercial venture after all costs have been deducted. A company's profitability is determined by subtracting all of its expenses from its total revenue. A company's whole operations depend on its ability to turn a profit, so if it fails it may have an impact on suppliers, workers, and the community. A company's profitability serves as a gauge of its overall success. Investors could want a single profitability metric that makes sense in every circumstance. The goal of the test of profitability is to determine if income is sufficient by contrasting it with one or more major activities that are reported in the financial statements (Imtiaz *et al.*, 2019).

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Profit refers to an absolute amount of income generated by the company within a period of time, while profitability is the ability of the firm to make profit based on its sales (Syafrizal *et al.*, 2023). A high interest rate spread acts as an impediment to the expansion of financial intermediation necessary for growth and development of an economy. It is often argued that the higher the interest rate spread, higher would be the cost of credit to the borrowers for any given deposit rate. Alternatively, a high interest rate spread could mean unusually low deposit rates discouraging savings and limiting resources available to finance bank credit (Annor and Obeng, 2017). Earnings per share is net income that is ready to be shared with shareholders divided by the number of shares of the company. Earnings per Share (EPS) is a form of giving benefits to shareholders from each share they own. Earnings per Share (EPS) is an indicator of the success that the company has achieved in creating profits for shareholders. The level of profit generated per share owned by investors will affect the investor's assessment of an issuer's company performance. A low ratio means that management has not succeeded in satisfying shareholders, on the contrary, with a high ratio, the welfare of shareholders increases in another sense, that the rate of return is high (Barnor and Odonkor, 2012). Earnings per Share (EPS) describes the amount of rupiah earned for each common share. Prospective shareholders are interested in EPS which is great, because EPS is one such indicator of the success of a company that will have an impact on the increase in the stock price (Collaku and Aliu, 2021).

Antwi (2019) analyzed the effect of capital adequacy ratio, non performing financing, financing to deposit ratio, operating expenses and operational income on profitability at PT Sharia Aceh Bank. The study indicated that capital adequacy ratio has partial impact whereas non-performing financing has a positive and significant impact on profitability of banks. In contrast, financing to deposit ratio has a negative but significant impact on profitability at PT Sharia Aceh Bank. Similarly, Rizal and Rofiqo (2020) examined the effect of Sharia banking characteristics such as capital adequacy ratio, financing to deposit ratio, non-performing financing, operating expenses to operations revenue on return on assets. The study showed that capital adequacy ratio, non-performing financing, and operating expenses to operations revenue have significant influence on return on assets but financing to deposit ratio has no impact on return on assets. Likewise, Salami and Uthman (2018) investigated the impact of bank capital and stability on financial performance of banks. The study revealed that there is a negative relationship between cost to income ratio and profitability and stability of banks. The study also found that operating efficiency measured by cost-to income ratio has a negative impact on banks' performance. Further, Spaseska *et al.* (2022) assessed the impact of capital adequacy ratio on the banks' profitability in North Macedonia. The study found that there is a positive but statistically insignificant relationship between capital adequacy ratio and return on average assets of the Macedonian banks, both in the short- and long-run.

Collins (2011) examined the effects of interest rate spread on the level of non-performing assets: A case of commercial banks in Kenya. The study found that interest rate spread leads to increase in non-performing loans. Similarly, Rumler and Waschiczek (2014) assessed have changes in the financial structure affected bank profitability? Evidence for Austria. The study stated that there is a positive relationship between inflation rates and profitability of Austrian banking sector. Likewise, Wadood *et al.* (2020) analyzed the factors affecting bank profitability in Pakistan. The study found that there is a negative but statistically significant relationship between inflation and profitability ratios measured by return on assets and return on equity over the period of time. Further, Olokoyo (2011) investigated the determinants of commercial banks' lending behavior in the Nigerian context. The study found that interest rate spread affect performance assets in banks as it increases the

cost of loans charged on the borrowers. In addition, Ndiritu *et al.* (2024) accessed the effect of interest rate spread on financial performance of commercial banks in Kenya. The study showed that spread rate provided sufficient margins for banks to continue operating in the market. The study also showed that interest rates spread affect the performance of commercial banks in Kenya to a large extent.

Nadeem *et al.* (2018) investigated determinants of banks' profitability in Pakistan by using the panel data of 18 banks from the period of 2001 to 2010. The study indicated that there has a negative and significant effect of bank size, credit risk, liquidity, taxation, and nontraditional activity on profitability. Similarly, Tan and Floros (2013) examined the determinants of bank profitability. The study stated that there is a positive relationship between bank profitability, cost efficiency, banking sector development, stock market development and inflation. Likewise, Adeusi *et al.* (2014) examined the factors that influence the profitability level of commercial banks in Nigeria. The study revealed that asset quality, management efficiency, and economic growth were the determinants of commercial banks' profitability. Further, Spaseska *et al.* (2022) indicated that there is a significant correlation of GDP as an external factor with return on assets, return on equity and net interest margin. On the other hand, inflation rate has no any significant influence on the profitability measured by return on assets and return on equity. Moreover, Sulaeman *et al.* (2019) analyzed internal and external factors that affect banking efficiency. The study found that in conventional commercial banks, the LDR, the CAR, economic growth, and inflation have a significantly positive effect on the efficiency of conventional commercial banks.

Leon (2020) explored the effect of credit risk and macroeconomic factors on profitability of 20 ASEAN banks, particularly from Indonesia, Malaysia, Thailand and Philippines. The study found that credit risk and gross domestic product negatively affect in return on equity. The study also found that credit risk and GDP growth negatively affect return on assets. The study also concluded that inflation rate has a highest impact on return on equity followed by GDP growth and credit risk. In a similar way, Patwary and Tasneem (2019) examined the impact of non-performing loan ratio, capital adequacy ratio and provision maintenance ratio on the return on asset (ROA) of all banks based on the twenty-one years data. The study revealed that there are different directional short-run causality exist between variables and the OLS regression analysis confirms that non-performing loan ratio and provision maintenance ratio are statistically significant with return on asset. Likewise, Kingu *et al.* (2018) investigated the impact of non-performing loans on bank's profitability: Empirical evidence from commercial banks in Tanzania. The study found that occurrence of non-performing loans is negatively associated with the level of profitability in commercial banks in Tanzania.

Adebisi and Matthew (2015) investigated the impact of non-performing loans on firms' profitability of banks in Nigeria. The study showed that there is a negative relationship between non-performing loan and return on equity of Nigerian Banks. Similarly, Nugraha *et al.* (2021) examined the impact of non-performing loans, loan to deposit ratio and education diversity on firm performance of Indonesia banking sectors. The results showed that non-performing loans have a significant negative effect on return on assets, and the loan to deposit ratio has a significant positive effect on return on assets. Likewise, Saleh and Winarso (2021) investigated on analysis of non-performing loans (NPL) and loan to deposit ratio (LDR) towards profitability. The result showed that non-performing loan has a negative impact on profitability proxies as return on assets. Further, Chandrasegaran (2020) assessed the capital adequacy requirements and profitability in Sri Lanka. The study showed that capital

adequacy ratio has a positive and significant impact non-interest income to average assets. In addition, Alnajjar and Othman (2021) examined the impact of capital adequacy ratio (CAR) on Islamic banks' performance in selected MENA countries. The study found that there is a statistically significant but negative impact of capital adequacy ratio on both performance indicators return on equity and return on assets. Moreover, Samad (2015) investigated the impact of bank specific characteristics and macroeconomic variables on the banks' profitability of Bangladesh banking industry. The study concluded that loan deposit ratio has a significant impact on profitability of Bangladesh commercial bank. Likewise, Djaya and Yanuarti (2021) examined the influence of capital adequacy ratio and non-performing loan on profitability of commercial banks listed on the Indonesia stock exchange in 2017-2019. The study showed that capital adequacy ratio and non-performing loan simultaneously impact the profitability of banks.

In the context of Nepal, Poudel and Subedi (2016) analyzed the impact of loan to deposit ratio on the profitability of Nepalese commercial banks. The findings indicated that an optimal loan to deposit ratio positively affected return on equity. Similarly, Rayamajhi and Bhandari (2024) investigated the effect of capital adequacy, bank size and lending interest rate on profitability of commercial banks in Nepal. The study found a positive relationship between capital adequacy ratio, bank size and profitability metrics. Likewise, Dahal and Khanal (2017) assessed the impact of spread rate on the profitability of Nepalese commercial banks. The study revealed that a wider spread positively influenced net interest income and consequently enhanced overall profitability of banks. Further, Shrestha and Thapa (2015) investigated the impact of non-performing loans on the profitability of Nepalese commercial banks. The study revealed a statistically significant negative relationship between NPL and return on assets, emphasizing the importance of managing and minimizing non-performing assets for sustained profitability.

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

The major objective of the study is to examine the effect of interest rate spread on profitability of Nepalese commercial banks. Specifically, it examines the relationship of capital adequacy ratio, non-performing loan, base rate, spread rate, credit to deposit ratio 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 section draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were collected from 19 Nepalese commercial banks from the year 2012/13 to 2022/23, leading to a total of 209 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

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

S.N.	Name of the commercial banks	Study period	Observations
1	Nepal Bank Limited	2012/13-2022/23	11
2	Rastriya Banijya Bank Limited	2012/13-2022/23	11
3	Agricultural Development Bank Limited	2012/13-2022/23	11
4	Nabil Bank Limited	2012/13-2022/23	11
5	Standard Chartered Bank Nepal Limited	2012/13-2022/23	11
6	Himalayan Bank Limited	2012/13-2022/23	11
7	Nepal SBI Bank Limited	2012/13-2022/23	11
8	Everest Bank Limited	2012/13-2022/23	11
9	NIC Asia Bank Limited	2012/13-2022/23	11
10	Machhapuchchhre Bank Limited	2012/13-2022/23	11
11	Kumari Bank Limited	2012/13-2022/23	11
12	Laxmi Sunrise Bank Limited	2012/13-2022/23	11
13	Siddharth Bank Limited	2012/13-2022/23	11
14	Global IME Bank Limited	2012/13-2022/23	11
15	Citizens Bank International Limited	2012/13-2022/23	11
16	Prime Commercial Bank Limited	2012/13-2022/23	11
17	NMB Bank Limited	2012/13-2022/23	11
18	Prabhu Bank Limited	2012/13-2022/23	11
19	Sanima Bank Limited	2012/13-2022/23	11
Total number of observations			209

Thus, the study is based on the 209 observations.

The model

The model used in this study assumes that profitability of banks depends upon interest rate spread. The dependent variables selected for the study are return on assets and earning per share. Similarly, the selected independent variables are capital adequacy ratio, non-performing loan, base rate, spread rate, credit to deposit ratio and inflation. Therefore, the models take the following forms:

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BR_{it} + \beta_4 SR_{it} + \beta_5 CD_{it} + \beta_6 I_{it} + e_{it}$$

$$EPS_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BR_{it} + \beta_4 SR_{it} + \beta_5 CD_{it} + \beta_6 I_{it} + e_{it}$$

Where,

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

EPS = Earnings per share as measured by net income divided by total number of shares, in Rs.

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

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

BR = Base rate as measured by the ratio of cost of doing banking business to total deposit, in percentage.

SR = Spread rate as measured by net weighted interest difference between interest received from loan and interest paid to deposit, in percentage.

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

I = Inflation as measured by percentage change in the price of a basket of goods and services consumed by households, in percentage.

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

Capital adequacy ratio

Capital adequacy ratio is a bank performance ratio that assesses the extent to which the capital owned by the bank is able to face the risk of credit failure faced by the bank. Hersugondo *et al.* (2021) revealed that capital adequacy has a significant positive impact on bank performance. Similarly, Dao and Ta (2020) found a negative relationship between capital adequacy ratio and profitability. Likewise, Al-Homaidi *et al.* (2020) showed that capital adequacy ratio has a positive and significant impact on ROA. Likewise, Ogboi and Unuafé (2013) showed that credit risk management and capital adequacy ratio have a positive impact on financial performance. Based on it, this study develops the following hypothesis:

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

Non-performing loan

High number of non-performing loans may lead to a decrease in ROA (Laryea *et al.*, 2016). Similarly, Kwashie *et al.* (2022) showed that non-performing loans have negative impact on financial performance. Likewise, Safitri and Oktavia (2022) found that non-performing loan has a negative but significant impact on return on assets. Further, Bandara *et al.* (2021) showed that non-performing loans have negative but significant association with return on assets. In addition, Do *et al.* (2020) revealed that non-performing loans have negative impact on bank's profitability. Similarly, Altunbas *et al.* (2000) stated that there is a negative relationship between non-performing loan ratio and performance of the banks. Based on it, this study develops the following hypothesis:

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

Base rate

Base rate emerges as a pivotal benchmark, shaping the interest rate structure within a country's banking system. Yusuf and Isa (2021) examined the impact of lease financing on Malaysian Islamic Bank performance. The study showed that base rate has a positive impact on return on assets. Similarly, Ngaruiya *et al.* (2022) assessed the effect of changes in interest rate regulation on the financial performance of banks in Kenya. The study revealed that introduction of interest rate caps significantly increased the profitability of banks. Likewise, Islam and Nishiyama (2016) analyzed the determinants of bank profitability: dynamic panel evidence from south Asian countries. The study found a negative impact of cost of fund rate on banks' profitability. Based on it, this study develops the following hypothesis:

H₃: There is a positive relationship between base rate and profitability of banks.

Spread rate

Aremu *et al.* (2013) found that interest spread is significantly associated with bank profitability in the long run but insignificant in the short run. Similarly, Owusu-Antwi *et al.* (2017) revealed that bank spread affect profitability of commercial banks in Ghana positively but the relationship is statistically insignificant. Further, Sheriff and Amoako (2014) showed that high interest rate spread in Ghana is determined by inflation, total deposits and public

sector borrowing but negatively related to treasury bills. Based on it, this study develops the following hypothesis:

H4: There is a positive relationship between spread rate and profitability of banks.

Credit to deposit ratio

Sharifi and Akhter (2016) revealed that credit to deposit ratio positively influence the public sector bank's financial performance. Likewise, Shafana (2015) showed that credit to deposit ratio has a significant positive impact on profitability of financial institutions. In addition, Bolek and Wilinski (2012) stated that credit to deposit ratio has a positive impact on the profitability of banks. Similarly, Sari *et al.* (2017) analyzed the effect of third-party fund, capital adequacy ratio, and loan to deposit ratio on bank's profitability after the application of IFRS. The study found that loan to deposit ratio (LDR) partially has positive but not significant impact on return on assets. Based on it, this study develops the following hypothesis:

H5: There is a positive relationship between credit to deposit ratio and profitability of banks.

Inflation

Chioma *et al.* (2014) found that there is a negative and insignificant relationship between inflation and bank profitability. Likewise, Isayas (2022) examined the determinants of banks' profitability: Empirical evidence from banks in Ethiopia. The study showed that inflation rate have a negative but statistically insignificant impact on the profitability of banks. In addition, Lohano and Kashif (2019) assessed the factors affecting the profitability of banks in developing countries. The study showed that inflation has a negative impact on profitability of banks. Based on it, this study develops the following hypothesis:

H6: There is a negative relationship between inflation and profitability of banks.

3. Results and discussion

Descriptive statistics

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

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 19 Nepalese commercial banks for the study period from 2012/13 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and EPS (Earnings per share as measured by net income divided by total number of shares, in Rs). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loans, in percentage), BR (Base rate as measured by the ratio of cost of doing banking business to total deposit, in percentage), SR (Spread rate as measured by net weighted interest difference between interest received from loan and interest paid to deposit, in percentage), CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage) and I (Inflation as measured by percentage change in the price of a basket of goods and services consumed by households, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.45	3.25	1.56	0.504
EPS	-40.23	198.53	27.74	20.308
CAR	-0.49	23.31	13.34	2.604
NPL	0.01	24.19	1.83	2.124
BR	4.17	11.78	8.46	1.725
SR	2.94	7.32	4.31	.7138
CD	44.27	90.13	75.42	6.760
I	3.60	9.92	6.65	2.205

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 19 Nepalese commercial banks for the study period from 2012/13 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and EPS (Earnings per share as measured by net income divided by total number of shares, in Rs). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loans, in percentage), BR (Base rate as measured by the ratio of cost of doing banking business to total deposit, in percentage), SR (Spread rate as measured by net weighted interest difference between interest received from loan and interest paid to deposit, in percentage), CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage) and I (Inflation as measured by percentage change in the price of a basket of goods and services consumed by households, in percentage).

Variables	ROA	EPS	CAR	NPL	BR	SR	CD	I
ROA	1							
EPS	0.507**	1						
CAR	0.291**	0.125	1					
NPL	-0.029	-0.091	-0.248**	1				
BR	0.184**	0.326**	0.124	0.01	1			
SR	0.357**	0.482**	-0.101	0.354**	-0.034	1		
CD	0.201**	0.244**	0.203**	-0.210**	0.379**	-0.164*	1	
I	-0.031	-0.204**	-0.367**	0.248**	-0.206**	0.274**	-0.164*	1

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

Table 3 shows that capital adequacy ratio has a positive relationship with return on assets. It means that increase in capital adequacy ratio leads to increase in return on assets. However, there is a negative relationship between non-performing loan and return on assets. It means that increase in non-performing loan leads to decrease in return on assets. In contrast, base rate has a positive relationship with return on assets. It shows that higher the base rate, higher would be the return on assets. Likewise, there is a positive relationship between spread rate and return on assets. It indicates that increase in spread rate leads to increase in return on assets. In addition, loan to deposit ratio has a positive relationship with return on assets. It indicates that increase in loan to deposit ratio leads to increase in return on

assets. However, there is a negative relationship between inflation and return on assets. It means that increase in inflation rate leads to decrease in return on assets.

Likewise, the result also shows that capital adequacy ratio has a positive relationship with earnings per share. It means that increase in capital adequacy ratio leads to increase in earnings per share. However, there is a negative relationship between non-performing loan and earnings per share. It means that increase in non-performing loan leads to decrease in earnings per share. In contrast, base rate has a positive relationship with earnings per share. It shows that higher the base rate, higher would be the earnings per share. Likewise, there is a positive relationship between spread rate and earnings per share. It indicates that increase in spread rate leads to increase in earnings per share. In addition, loan to deposit ratio has a positive relationship with earnings per share. It indicates that increase in loan to deposit ratio leads to increase in earnings per share. However, there is a negative relationship between inflation and earnings per share. It means that increase in inflation rate leads to decrease in earnings per share.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4. More specifically, it shows the regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, credit to deposit ratio, and inflation with return on assets.

Table 4

Estimated regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, loan to deposit ratio and inflation on return on assets

The results are based on panel data of 19 commercial banks with 209 observations for the period of 2012/13 to 2022/23 by using linear regression model. The model is $ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BR_{it} + \beta_4 SR_{it} + \beta_5 CD_{it} + \beta_6 I_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loans, in percentage), BR (Base rate as measured by the ratio of cost of doing banking business to total deposit, in percentage), SR (Spread rate as measured by net weighted interest difference between interest received from loan and interest paid to deposit, in percentage), CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage) and I (Inflation as measured by percentage change in the price of a basket of goods and services consumed by households, in percentage).

Models	Intercepts	Regression coefficients of						Adj.R_bar ²	SEE	F-value
		CAR	NPL	BR	SR	CD	I			
1	0.809 (4.622)**	0.056 (4.379)**						0.080	0.4835	19.17
2	1.574 (34.131)**		-0.007 (0.42)					0.004	0.5052	0.178
3	2.016 (11.698)**			0.054 (2.69)**				0.029	0.4968	7.242
4	0.475 (2.373)*				0.252 (5.50)**			0.124	0.472	30.31
5	2.693 (7.004)**					0.015 (2.95)**		0.036	0.4950	8.754
6	1.514 (13.61)**						-0.007 (0.441)	-0.004	0.5051	0.194
7	0.760 (3.99)**	0.059 (4.401)**	-0.011 (0.664)					0.078	0.484	9.781
8	1.235 (5.34)**	0.064 (4.93)**	-0.013 (0.828)	0.066 (3.45)**				0.124	0.471	10.83
9	-0.16	0.065	-0.022	0.062	0.294			0.274	0.429	20.66

	(-0.056)	(5.47)**	(1.40)	(3.53)**	(6.59)**					
10	0.829 (1.984)*	0.069 (5.84)**	-0.028 (1.833)*	0.043 (2.30)*	0.284 (6.42)**	0.013 (2.71)**		0.296	0.422	18.52
11	0.773 (1.763)	0.071 (5.67)**	-0.029 (1.86)	0.041 (2.191)*	0.279 (6.18)**	0.013 (2.71)**	-0.007 (0.432)	0.294	0.423	15.40

Notes:

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

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy has a positive impact on return on assets. This finding is consistent with the findings of Ogboi and Unuafé (2013). However, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Safitri and Oktavia (2022). In contrast, the beta coefficients for base rate are positive with return on assets. It indicates that base rate has a positive impact on return on assets. This finding is consistent with the findings of Yusuf and Isa (2021). Similarly, the beta coefficients for spread rate are positive with return on assets. It indicates that spread rate has a positive impact on return on assets. This finding contradicts with the findings of Sheriff and Amoako (2014). 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 Shafana (2015). In contrast, the beta coefficients for inflation are negative with return on assets. It indicates that inflation has a negative impact on return on assets. This finding is consistent with the findings of Chioma *et al.* (2014).

Table 5 shows the regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, loan to deposit ratio and inflation with earning per share.

Table 5

Estimated regression results of capital adequacy ratio, non-performing loan, base rate, spread rate, loan to deposit ratio and inflation on earning per share

The results are based on panel data of 19 commercial banks with 209 observations for the period of 2012/13 to 2022/23 by using linear regression model. The model is $EPS_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPL_{it} + \beta_3 BR_{it} + \beta_4 SR_{it} + \beta_5 CD_{it} + \beta_6 I_{it} + e_{it}$ where, the dependent variable is EPS (Earnings per share as measured by net income divided by total number of shares, in Rs). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total bank capital to total risk weighted assets, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loans, in percentage), BR (Base rate as measured by the ratio of cost of doing banking business to total deposit, in percentage), SR (Spread rate as measured by net weighted interest difference between interest received from loan and interest paid to deposit, in percentage), CD (Credit to deposit ratio as measured by the ratio of total loan to total deposit, in percentage) and I (Inflation as measured by percentage change in the price of a basket of goods and services consumed by households, in percentage).

Models	Intercepts	Regression coefficients of						Adj.R_bar ²	SEE	F-value
		CAR	NPL	BR	SR	CD	I			
1	40.794 (5.578)**	0.978 (1.818)						0.011	20.196	3.306
2	29.332 (15.845)**		-0.871 (1.316)					0.004	20.272	1.732
3	60.200 (9.016)**			3.837 (4.96)**				0.102	19.245	24.60
4	-31.263 (-4.134)**				13.703 (7.91)**			0.228	17.840	62.53
5	83.060					0.734		0.055	19.74	13.12

	(5.418)**					(3.62)**				
6	15.220 (3.468)**						-1.883 (3.00)**	0.037	19.927	9.033
7	46.426 (5.884)**	1.229 (2.22)*	-1.244 (1.839)					0.022	20.081	3.363
8	72.729 (7.77)**	0.902 (1.702)	-1.115 (1.729)	3.653 (4.71)**				0.114	19.121	9.878
9	3.377 (0.326)	0.860 (1.974)*	-3.042 (5.39)**	3.406 (5.34)**	16.306 (9.988)**			0.402	15.708	35.91
10	23.933 (1.550)	0.767 (1.759)	-3.202 (5.63)**	2.947 (4.31)**	16.047 (9.843)**	0.322 (1.78)		0.408	15.624	29.68
11	21.062 (1.301)	0.681 (1.482)	-3.239 (5.66)**	2.875 (4.13)**	15.838 (9.485)**	0.324 (1.795)	-0.335 (0.599)	0.406	15.649	24.71

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. Earnings per share is the dependent variable.

Table 5 shows that the beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy has a positive impact on return on assets. This finding is consistent with the findings of Dao and Nguyen (2020). However, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Bandara *et al.* (2021). In contrast, the beta coefficients for base rate are positive with return on assets. It indicates that base rate has a positive impact on return on assets. This finding is consistent with the findings of Yusuf and Isa (2021). Similarly, the beta coefficients for spread rate are positive with return on assets. It indicates that spread rate has a positive impact on return on assets. This finding contradicts with the findings of Sheriff and Amoako (2014). 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 Bolek and Wilinski (2012). In contrast, the beta coefficients for inflation are negative with return on assets. It indicates that inflation has a negative impact on return on assets. This finding is consistent with the findings of Lohano and Kashif (2019).

4. Summary and conclusion

Banking institutions, in particular, play a crucial role in shaping a nation's progress, as their development initiatives set the stage for economic growth. The stability of the banking sector emerges as a linchpin for overall economic development. Banks are the most integral part of the financial sector of any country as they dominate the financial sector by contributing much to the economic growth of the country. Soundness of a bank is the result of an assessment of the bank condition conducted on the risks and performance of the bank. Banks also play a remarkable role in generating employment opportunities, enhancing financial resources, and the overall development of a country. It contributes to enlarge the industrial activities and investment activities. Bank's financial performance is the result of the bank's internal roles, regulation, policies, activities, effectiveness, efficiency and overall performance in the monetary terms.

This study attempts to analyze the effect of interest rate spread on profitability of Nepalese commercial banks. The study is based on secondary data of 19 Nepalese commercial banks with 209 observations for the study period from 2012/13 to 2022/23.

The major conclusion of this study is that capital adequacy ratio, base rate, spread rate and credit to deposit ratio have positive impact on return on assets and earnings per share. It

indicates that increase in capital adequacy ratio, base rate, spread rate and credit to deposit ratio leads to increase in return on assets and earnings per share. However, non-performing loan and inflation have negative impact on return on assets and earnings per share. It indicates that increase in non-performing loan and inflation leads to decrease in return on assets and earnings per share. Likewise, the study also concluded that spread rate 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 spread rate followed by base rate is the most influencing factor that explains the changes in the earnings per share in the context of Nepalese commercial banks.

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