Effect of Loan Defaults on the Profitability of Nepalese Commercial Banks

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Abstract

The study examines the effect of loan defaults on the profitability of Nepalese commercial banks. The dependent variables selected for the study are return on equity and return on assets. The selected independent variables are bank size, interest spread rate, loan loss provision, non-performing loan, capital adequacy ratio, and credit-to-deposit ratio. The study is based on secondary data of 15 commercial banks with 105 observations for the study period from 2016/17 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, publications and websites of Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of loan defaults on the profitability of Nepalese commercial banks.

The study showed that interest spread rate has a positive impact on return on assets and return on equity. It implies that increase in interest spread rate leads to increase in return on assets and return on equity. In addition, capital adequacy ratio has a positive impact on return on assets and return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on assets and return on equity. However, nonperforming loan has a negative impact on return on assets and return on equity. It implies that increase in nonperforming loan leads to decrease in return on assets and return on equity. Moreover, loan loss provision has a negative impact on return on assets and return on equity indicating increase in loan loss provision leads to decrease in return on assets and return on equity. Furthermore, bank size has a positive impact on return on assets and return on equity. It means that increase in bank assets size leads to increase in return on assets and return on equity.

Keywords: interest spread rate, loan loss provision, non-performing loan, capital adequacy ratio, credit to deposit ratio, return on equity, return on assets

1. Introduction

In the intricate landscape of the financial world, the symbiotic relationship between lending institutions and borrowers shapes the foundation

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of economies. Commercial banks, as crucial intermediaries, extend credit to individuals and businesses, facilitating growth and fostering financial stability. Loan default is a critical concern for commercial banks worldwide as it can significantly affect their profitability and overall financial stability. Loan default occurs when borrowers fail to fulfill their repayment obligations, which can have direct and indirect consequences on the profitability of commercial banks. The banking sector plays a pivotal role in the economic development of any country by providing financial intermediation and fostering economic growth. Commercial banks, as key players in this sector, facilitate the flow of funds from savers to borrowers, thereby stimulating investment and consumption (Njeri *et al.,* 2013). The loan default negatively impacts a bank's financial health, erodes its capital, increases provisioning costs, and potentially leads to liquidity and solvency issues (Rajan and Dhar, 2020; Berger and DeYoung, 1997). Efficient credit risk management is crucial for minimizing loan default. Effective credit assessment, risk monitoring, and early intervention mechanisms can help banks prevent or mitigate the effect of loan defaults on profitability (Altman and Saunders, 2015). Loan default necessitates higher loan loss provisions, impacting a bank's income statement and profitability. Insufficient provisioning not only affects current earnings but can also lead to capital erosion, affecting a bank's capital adequacy and long-term profitability (Gande and Lewis, 2020)

Banks employ various strategies to manage loan defaults and enhance profitability. These strategies include improved risk assessment models, collateral requirements, loan structuring, and enhanced recovery efforts (Borio and Drehmann, 2009). Non-Performing Loans (NPLs), which signify delayed or missed payments, contribute to loan default. There is a strong negative correlation between NPL ratios and bank profitability. Moreover, Hussain (2014) analyzed the determinants of the Interest Rate Spread (IRS) in commercial banks in Pakistan. The study empirically concluded that non-performing loans, inflation rate and exchange rate have a positive impact on the IRS. The regulatory environment and political stability in a country can impact loan default rates. Unpredictable changes in regulations, government policies, or legal frameworks can disrupt borrowers' ability to fulfill their obligations, leading to loan defaults. Effective credit risk management, provisioning, and mitigation strategies are essential to minimizing the effect of loan default and maintaining sustainable profitability for commercial banks. Flawed credit risk assessment processes can contribute to loan default. Inaccurate evaluation of a borrower's creditworthiness, income, and repayment capacity may result in loans being extended to individuals or businesses that are at higher risk of default (Berger and Udell, 2002).

The banking industry is undergoing a radical shift, one driven by new competition from changing business models, mounting regulation and

compliance pressures, and disruptive technologies. Banks still have to generate profit for their shareholders and perform their baking role in the market. Basically, non-performing loan (NPL) reflects the performance standard of the banks. Banks are required by law to report their ratio of non-performing loans to total loans as a measure of the bank's level of credit risk and quality of outstanding loans. A high ratio means that the bank is at a greater risk of loss if it does not recover the owed loan amounts, whereas a small ratio means that the outstanding loans present a low risk to the bank. The NPL growth involves the necessity of provisions because it decreases the overall profits. If there is a high proportion of bank credit there will be a higher probability that the banks can suffer from the financial crisis and vice versa. Breuer (2006) found that problem bank loans are the outcome of decisions made by banks in the dual role they serve as financial intermediaries. This dual role necessarily introduces conflicts of interest that can lead to bank mismanagement and consequently problem bank loans. Better control of corruption, a sound regulatory quality, better enforcement of rule of law, and a free voice and accountability play an important role in reducing NPL (Boudriga et al., 2010).

Gabriel et al. (2019) examined the effect of non-performing loans on the financial performance of commercial banks in Nigeria between the periods of 1985 to 2016. The result of the study showed that non-performing loans to total loans ratio and cash reserve ratio had statistically negative significant effect on return on asset. The result showed that a high level of non-performing loans would reduce the financial performance of commercial banks in Nigeria. Anggriani and Muniarty (2020) stressed that banks should lower the level of non-performing loan to increase return on assets suggesting a negative relationship between non-performing loan and profitability. Banks need to set aside provisions to cover potential losses from non-performing loans. This provisioning reduces the bank's profit because its essentially money set aside that cannot be utilized for other purposes. 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 concluded that non-performing loan is negatively related to bank profitability. Similarly, Collaku and Aliu (2021) showed a significant negative relationship between non-performing loan and profitability as measured by return on assets of commercial banks in Kosovo. A high level of non-performing loans can harm a bank's reputation, making it less attractive to potential depositors and investors. This could lead to a loss of business and further impact profitability.

The presence of non-performing loans erodes a bank's profitability by reducing revenue, increasing costs, and creating negative perceptions among stakeholders. Therefore, banks strive to minimize their exposure to non-performing loans through effective risk management practices and loan quality assessments. Patwary and Tasneem (2019) determined the effect of

non-performing loan on profitability of banks in Bangladesh. The study found a negative relationship between non-performing loan and bank profitability. Banks must divert resources, both financial and human, towards managing and recovering non-performing loans. This diverts resources away from more profitable activities, which can hinder overall profitability. In addition, 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. Moreover, Dewi and Badjra (2020) revealed that non-performing loan is negatively related to profitability. Likewise, Uddin (2022) investigated the impact of leverage, operating efficiency, non-performing loans, and capital adequacy ratio on the profitability of commercial banks in Bangladesh. The study concluded that leverage and non-performing loans have negative and insignificant effects on profitability, at the same time operating efficiency and capital adequacy ratio have positive and insignificant and positive and significant effects on profitability.

In the context of Nepal, Adhikari (2021) assessed the efficiency, profitability and stability of the Nepalese commercial banks. The study showed that capital adequacy ratio and GDP are positively related to return on assets but it is not statistically significant. The study also found that non-performing loan has a negative and significant relationship with return on assets of Nepalese commercial banks. Gautam (2019) identified that credit to deposit ratio is positively related to return on assets and return on equity but it is not statistically significant. Further, the study found that non-performing loans has a positive and significant relationship with return on assets but negative and insignificant relationship with return on equity of Nepalese commercial banks. Bhattarai (2017) examined the effect of NPL on the profitability of Nepalese commercial banks. The study found that the NPL ratio has a negative effect on ROA whereas NPL ratio has a positive effect on ROE.

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

The major objective of the study is to examine the effect of loan default on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of bank size, interest spread rate, loan loss provision, non-performing loan, capital adequacy ratio, and credit to deposit ratio on return on assets and return on equity of Nepalese commercial banks.

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

2. Methodological aspects

The study is based on the secondary data which were collected from 15 Nepalese commercial banks from 2016/17 to 2022/23, leading to a total of 105 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB) and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

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

S.N.	Name of the banks	Study period	Observation
Public banks			
1	Agricultural Development Bank Limited	2016/17-2022/23	7
2	Nepal Bank Limited	2016/17-2022/23	7
3	Rastriya Banijya Bank Limited	2016/17-2022/23	7
Joint venture banks			
1	Nabil Bank Limited	2016/17-2022/23	7
2	Himalayan Bank Limited	2016/17-2022/23	7
3	NMB Bank Limited	2016/17-2022/23	7
Private banks			
1	Kumari Bank Limited	2016/17-2022/23	7
2	Prime Commercial Bank Limited	2016/17-2022/23	7
3	Citizens Bank International Limited	2016/17-2022/23	7
4	Siddhartha Bank Limited	2016/17-2022/23	7
5	Sanima Bank Limited	2016/17-2022/23	7
6	Everest Bank Limited	2016/17-2022/23	7
7	Machhapuchchhre Bank Limited	2016/17-2022/23	7
8	Nepal SBI Bank Limited	2016/17-2022/23	7
9	Standard Chartered Bank Limited	2016/17-2022/23	7
	Total number of observations		**105**

Thus, the study is based on 105 observations.

The model

The model used in this study assumes that profitability depends upon effect of loan defaults. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are interest spread rate, capital adequacy ratio, non-performing loan, credit to deposit ratio, loan loss provision, and bank size. Therefore, the models take the following forms:

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

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

Where,

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

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

ISR = Interest spread rate as measured by the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial banks, in percentage.

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

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

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

LLP = Loan loss provision as measured by loan loss divided by non-performing loan, in percentage.

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

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

Interest spread rate

An interest rate spread is a critical financial concept that plays a pivotal role in various economic sectors. It refers to the difference between the interest rates earned on different financial instruments or assets. Khan and Sattar (2014) assessed the impact of interest rate changes on the profitability

of four major commercial banks in Pakistan. The study concluded that there is a positive strong relationship between interest rate and bank's profitability. Similarly, Ngugi and Roulet (2001) concluded that in a competitive banking environment, banks might offer higher deposit rates to attract customers, squeezing the IRS. Likewise, Morris *et al*. (2020) concluded that the financial systems in developing countries often exhibit higher IRS compared to developed economies, and it has a negative impact on bank's profitability. Based on it, this study develops the following hypothesis:

H_1: There is a positive relationship between interest rate spread and bank's profitability.

Capital adequacy ratio

The capital adequacy ratio is calculated by dividing the sum of primary and supplementary capital by risk-weighted assets (percentage). Higher CAR indicates a stronger financial position and ability to absorb losses. Banks with higher capital adequacy ratios may have lower risk appetites. There is a significant and positive association between the capital adequacy ratio and bank's profitability (Arseto *et al.,* 2022). Similarly, Nguyen (2020) explored the impact of capital adequacy on bank profitability in the context of Vietnam. The study found that capital adequacy ratio has a positive impact on bank's profitability. Likewise, Astuti (2023) concluded that capital adequacy ratio has a positive impact on return on assets. Further, Ebenezer *et al.* (2020) stated that capital adequacy ratio has a positive and significant impact on bank's profitability. Moreover, Cornett *et al.* (2018) found a positive relationship between capital adequacy on both return on assets and return on equity. Based on it, this study develops the following hypothesis:

H_2: There is a positive relationship between the capital adequacy ratio and bank's profitability.

Non-performing loan

Non-Performing Loans (NPLs) are loans held by financial institutions that borrowers have failed to repay according to the agreed terms, typically due to default or extended delinquency. Yuksel and Zengin (2017) assessed the influencing factors of net interest margin in Turkish banking sector. The study stated that high levels of non-performing loans can erode investor confidence in a bank's financial health and stability. Similarly, Anggriani and Muniarty (2020) stated that banks should lower the level of non-performing loan to increase return on assets. In contrast, Marshal and Onyekachi (2014) found that there is a positive relationship between non-performing loans and banks' performance. Based on it, this study develops the following hypothesis:

H_3: There is a negative relationship between non-performing loans and bank's profitability.

Credit to deposit ratio

The magnitude of a bank's Credit to Deposit Ratio (CDR) can wield a substantial influence on its profitability, as evidenced by various studies. Pariyada (2013) examined the impact of CDR on a bank's overall profitability. The study revealed that there is a positive relationship between bank's profitability and credit to deposit ratio. Similarly, Nugraha *et al.* (2021) stated that credit to deposit ratio has a positive impact on return on assets. Further, Gurung and Gurung (2022) showed that credit to deposit ratio has a positive impact on both return on assets and net interest margin. In addition, Kalimashi *et al.* (2022) explored the relationship between liquidity risk management and commercial bank performance. The study found that credit to deposit ratio has a positive impact return on assets but negative impact on net interest margin. Based on it, this study develops the following hypothesis:

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

Loan loss provision

Fernando and Ekanayake (2015) found a negative relationship between loan loss provision and profits before tax. Similarly, Farooq *et al.* (2003) concluded that bank loans have a negative and significant impact on profitability. Likewise, Abreu and Mendes (2000) asserted that there is a negative relationship between loan ratio and profitability. Further, Gitogo *et al.* (2013) found that there is a negative impact of credit risk measured by loan loss provision on bank's profitability. Moreover, Duho (2020) revealed that credit risk has a negative impact on profit efficiency and return on equity. Based on it, this study develops the following hypothesis:

$H_{5:}$ There is a negative relationship between loan loss provisions and bank's profitability.

Bank size

Bank size is measured as the natural logarithm of total assets of the bank (Riaz and Mehar, 2013). Mondol and Wadud (2022) revealed that there is a positive and significant relationship between the financial performance and medium sized banks. Similarly, Gul *et al.* (2011) found a direct relationship between bank size and financial performance. Likewise, Mundanya and Muturi (2018) revealed that bank size is positively correlated to financial performance. Further, Murtiningsih and Tohirin (2020) investigated the impact of bank-specific, industry-specific and macroeconomic variables on commercial bank

the financial performance. The study found that bank size has a positive and significant impact on both return on assets and return on equity. In addition, Nugraha *et al.* (2021) showed a positive relationship between bank size and financial performance. Based on it, the study develops following hypothesis:

H_6: There is a positive relationship between bank size 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 2016/17 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2016/17 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are ISR (Interest spread rate as measured by the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial banks, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision as measured by loan loss divided by non-performing loan, in percentage), and BS (Bank size as measured by total assets, Rs. in billions).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	2.77	1.50	0.45
ROE	6.67	23.20	13.83	4.07
ISR	1.96	5.46	4.12	0.51
CAR	11.27	97.92	17.46	12.01
NPL	0.02	4.93	1.37	1.19
CDR	56.75	107.01	86.38	8.11
LLP	66.50	11578.19	628.39	1347.24
BS	59.69	469.25	175.40	76.99

Source: SPSS Software

Correlation analysis

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

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 15 Nepalese commercial banks for the study period of 2016/17 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage) and ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are ISR (Interest spread rate as measured by the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial banks, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision as measured by loan loss divided by non-performing loan, in percentage), and BS (Bank size as measured by total assets, Rs. in billions).

Variables	ROA	ROE	ISR	CAR	NPL	CDR	LLP	BS
ROA	1							
ROE	0.268**	1						
ISR	0.258**	0.029	1					
CAR	0.046	0.037	0.005	1				
NPL	-0.066	-0.061	0.154	0.241*	1			
CDR	-0.107	-0.366**	0.052	0.021	0.109	1		
LLP	-0.116	-0.006	0.044	0.216*	0.577**	0.043	1	
BS	0.361**	0.005	0.032	0.007	0.345**	0.166	0.189	1

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

Table 3 shows that interest spread rate has a positive relationship with return on assets. It indicates that increase in interest spread rate leads to increase 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. Likewise, 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, credit to deposit ratio has a negative relationship with return on assets. It indicates that increase in credit to deposit ratio leads to decrease in return on assets. In

addition, loan loss provision has a negative relationship with return on assets. It indicates that increase in loan loss provision leads to decrease in return on assets. Moreover, bank size has a positive relationship with return on assets. It indicates that increase in bank size leads to increase in return on assets.

Similarly, the result also shows that interest spread rate has a positive relationship with return on equity. It indicates that increase in interest spread rate leads to increase in return on equity. Moreover, capital adequacy ratio has a positive relationship with return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on equity. Likewise, 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, credit to deposit ratio has a negative relationship with return on equity. It indicates that increase in credit to deposit ratio leads to decrease in return on equity. In addition, loan loss provision has a negative relationship with return on equity. It indicates that increase in loan loss provision leads to decrease in return on equity. Moreover, bank size has a positive relationship with return on equity. It indicates that increase in bank size 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 spread rate, capital adequacy ratio, non-performing loan, credit to deposit ratio, loan loss provision, and bank size with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of interest spread rate, capital adequacy ratio, non-performing loan, credit to deposit ratio, loan loss provision, and bank size on return on assets

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2016/17 to 2022/23 by using the linear regression model and the model is ROA = $\beta_0 + \beta_1 ISR + \beta_2 CAR + \beta_3 NPL + \beta_4 CDR + \beta_5 LLP + \beta_6 BS + e_{it}$ where the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are ISR (Interest spread rate as measured by the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial banks, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision as measured by loan loss divided by non-performing loan, in percentage), and BS (Bank size

as measured by total assets, Rs. in billions).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		ISR	CAR	NPL	CDR	LLP	BS			
1	1.667 (22.068)**	0.318 (3.815)**						0.115	0.453	14.550
2	1.701 (3.233)**		0.020 (0.510)					0.007	0.483	0.260
3	0.772 (4.967)**			-0.216 (4.433)**				0.152	0.443	19.654
4	2.890 (4.226)**				-0.017 (2.135)*			0.033	0.473	4.557
5	1.606 (18.874)**					-0.010 (2.404)*		0.044	0.470	5.778
6	4.072 (2.859)**						0.237 (1.853)	0.023	0.476	3.435
7	1.687 (3.404)**	0.317 (3.757)**	0.001 (0.040)					0.107	0.455	7.206
8	1.035 (2.178)*	0.304 (3.933)**	0.001 (0.041)	-0.209 (4.567)**				0.252	0.416	12.690
9	1.455 (2.166)*	0.296 (3.825)**		-0.201 (4.269)**	-0.005 (0.671)			0.255	0.415	12.896
10	1.703 (2.735)**	0.238 (3.271)**		-0.263 (5.748)**	-0.007 (1.086)	-0.015 (4.311)**		0.255	0.415	12.896
11	3.147 (1.933)	0.236 (3.239)**		-0.247 (5.054)**	-0.009 (1.337)	-0.015 (4.199)**	0.109 (0.960)	0.365	0.380	12.976

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 interest spread rate are positive with return on assets. It indicates that interest spread rate has a positive impact on return on assets. This finding is similar to the findings of Ngugi and Roulet (2001). 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 Astuti (2023). Likewise, the beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Anggriani and Muniarty (2020). In addition, 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 not consistent with the findings of Astuti *et al.* (2023). Further, the beta coefficients for loan loss provision are negative with return on assets. It indicates that loan loss provision has a negative impact on return on assets. This finding is similar to the findings of Farooq *et al.* (2003). 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 Murtiningsih and Tohirin (2020).

Table 5 shows the estimated regression results of interest spread rate, capital adequacy ratio, non-performing loan, credit to deposit ratio, loan loss provision, and bank size on return on equity.

Table 5

Estimated regression results of interest spread rate, capital adequacy ratio, non-performing loan, credit to deposit ratio, loan loss provision, and bank size on return on equity

The results are based on panel data of 15 commercial banks with 105 observations for the period of 2016/17 to 2022/23 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 ISR + \beta_2 CAR + \beta_3 NPL + \beta_4 CDR + \beta_5 LLP + \beta_6 BS + e_{it}$ where the dependent variable is ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are ISR (Interest spread rate as measured by the interest rate charged by banks on loans to private sector customers minus the interest rate paid by commercial banks, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Non-performing loans as measured by the ratio of non-performing loans to total loans, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loans to total deposits, in percentage), LLP (Loan loss provision as measured by loan loss divided by non-performing loan, in percentage), and BS (Bank size as measured by total assets, Rs. in billions).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		ISR	CAR	NPL	CDR	LLP	BS			
1	15.760 (19.634)**	4.539 (5.130)**						0.196	4.807	26.322
2	14.212 (2.422)*		0.132 (0.307)					0.009	5.384	0.094
3	16.365 (8.867)**			-1.287 (2.226)*				0.037	5.261	4.957
4	9.210 (1.184)				-0.037 (0.413)			0.008	5.382	0.171
5	15.289 (16.719)**					-0.161 (3.729)**		0.110	5.056	13.902
6	14.156 (0.878)						0.156 (0.108)	0.010	5.386	0.012
7	14.010 (2.662)**	4.579 (5.108)**	0.131 (0.336)					0.189	4.828	13.104
8	18.351 (3.428)**	4.667 (5.631)**	0.130 (0.345)	-1.391 (2.701)**				0.236	4.685	11.708
9	13.490 (1.514)	4.758 (5.389)**	0.116 (0.305)	-1.301 (2.442)*	-0.056 (0.683)			0.232	4.698	8.851
10	13.956 (1.608)	4.374 (5.012)**	0.221 (0.595)	-0.862 (1.577)	-0.038 (0.468)	-0.108 (2.548)*		0.272	4.574	8.769
11	17.808 (0.763)	4.362 (4.959)**	0.192 (0.472)	-0.903 (1.518)	-0.033 (0.383)	-0.107 (2.480)*	0.264 (0.178)	0.265	4.596	7.241

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 4 shows that the beta coefficients for interest spread rate are positive with return on equity. It indicates that interest spread rate has a positive impact on return on equity. This finding is similar to the findings of Morris *et al*. (2020). Similarly, the beta coefficients for capital adequacy ratio are positive with return on equity. It indicates that capital adequacy ratio has a positive impact on return on equity. This finding is similar to the findings of Ebenezer *et al.* (2017). Likewise, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is consistent with the findings of Yuksel and Zengin (2017). In addition, 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 not consistent with the findings of Kalimashi *et al.* (2022). Further, the beta coefficients for loan loss provision are negative with return on equity. It indicates that loan loss provision has a negative impact on return on equity. This finding is consistent with the findings of Abreu and Mendes (2000). 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 similar to the findings of Nugraha *et al.* (2018).

4. Summary and conclusion

Default loans are loans where the borrower has stopped making payments of interest and principal, or where the payments are significantly overdue. Non-performing loans can have significant negative implications for banks and financial institutions. They can lead to lower interest income, increased provisioning for loan losses, and reduced profitability. Moreover, high levels of non-performing loans can erode investor confidence and negatively affect the bank's stock price. Overall, non-performing loans represent a critical aspect of credit risk management for banks, and monitoring their levels and trends is essential for assessing the financial health of financial institutions. When a bank's loan portfolio contains a significant proportion of non-performing loans, it indicates potential credit risk and can result in lower returns. Banks need to set aside provisions to cover potential losses from these non-performing loans, which can impact their profitability directly, thus reducing ROA and ROE.

This study attempts to analyse the effect of loan defaults on the profitability of Nepalese commercial banks. The study is based on secondary data of 15 commercial banks with 105 observations for the period from 2016/17 to 2022/23.

The major conclusion of this study is that interest spread rate, capital adequacy ratio and bank size have positive impact on return on assets and

return on equity. It indicates that increase in interest spread rate, capital adequacy ratio and bank size lead to increase in return on assets and return on equity. However, non-performing loan, credit to deposit ratio, and loan loss provision have negative impact on return on assets and return on equity. Non-performing loan, credit to deposit ratio, and loan loss provision are the key indicators in banking and financial analysis. Indeed, these factors have a negative impact on return on assets and return on equity for financial institutions. Non-performing loans, high credit to deposit ratios, and increased loan loss provisions all indicate higher credit risk and potential future losses for a financial institution. These factors erode profitability and can lead to lower returns on assets and equity. Further, the study also showed that higher interest spread rate, capital adequacy ratio, and larger bank size are associated with stronger financial performance and can lead to higher returns on assets and equity for financial institutions. Efficient management of interest rate risk, maintaining adequate capital buffers, and leveraging economies of scale are essential strategies for enhancing profitability and shareholder value in the banking sector. Likewise, the study also concluded that interest spread rate followed by bank size is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese commercial banks.

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