Determinants of Profitability in Nepalese Commercial Banks

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Abstract

This study examines the factors affecting profitability of Nepalese commercial banks. Return on assets and return on equity are selected as the dependent variables. The selected independent variables are firm size, capital adequacy ratio, total debt to total equity, total equity to total assets, total debt to total assets, non- performing loan. The study is based on secondary data of 10 commercial banks with 100 observations for the study period from 2013/14 to 2022/23. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank and annual reports of the selected commercial banks. The correlation coefficients and regression models are estimated to test the significance and importance of factors determining the profitability of Nepalese commercial banks.

The study showed that firm size has a positive impact on return on assets and return on equity. It indicates that larger the firm size, higher would be the return on assets and return on equity. Similarly, capital adequacy ratio has a positive impact on return on assets and return on equity. It indicates that higher the capital adequacy ratio, higher would be return on assets and return on equity. Likewise, total debt to total equity ratio has a negative effect on return on assets and return on equity. It indicates that higher the total debt to total equity ratio, lower would be the return on assets. In addition, total equity to total assets ratio has a negative effect on return on assets. It indicates that increase in total equity to total assets ratio leads to decrease in return on assets. Moreover, total debt to total assets ratio has a negative effect on return on assets. It means that increase in total debt to total assets ratio leads to decrease in return on assets. Furthermore, non-performing loans has a negative effect on return on assets and return on equity. It indicates that higher the non-performing loans, lower would be the return on assets and return on equity.

Keywords: firm size, capital adequacy ratio, total debt, total debt to total assets, non-performing loan, return on equity, return on assets

1. Introduction

The profitability of commercial banks reflects the strength and stability of the overall economy. Bank profitability is a key factor shaping financial development and economic growth (Osuagwu, 2014). By mobilizing savings and directing them toward profitable investments, these banks as the main financial intermediaries play a crucial role in supporting economic growth. Economies that have a profitable banking sector are better able to withstand negative shocks and contribute to the stability of the financial system (Athanasoglou *et al*., 2008). Comprehending the factors that influence profitability in Nepalese commercial banks is crucial for stakeholders, such as policymakers, investors, and bank management, as it offers valuable perspectives into the elements that propel financial performance and longevity. In order for the banking industry to effectively serve the aims of the country's economic development, it is imperative that it become more efficient and competitive.

The banking industry in general has experienced some profound changes in recent decades, as innovations in technology and the inexorable forces driving globalization continue to create both opportunities for growth and challenges for banking managers to

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remain profitable in this increasingly competitive environment (Arias, 2011). These major transformations in environment, resulting in significant impacts on its performance. Bank performance has substantive repercussions (effects) on investment, firm growth, industrial expansion, and economic development. Profitability is necessary for a bank to maintain ongoing activity and for its shareholders to obtain fair returns. Thereby, both external and internal factors have been affecting the profitability of banks over time. Therefore, the determinants of bank performance have attracted the interest of academic research as well as of bank management, financial markets, and bank supervisors/regulators (Weersainghe *et al*., 2013). Profitability is an important tool to evaluate the internal performance of a company. It helps to determine whether it has succeeded in achieving its ultimate objectives. Such an evaluation is the result of organizing managerial procedures and utilizing changes in external condition and optimizing assets utilization (Jumono and Mala*,* 2019). If a financial system is efficient, then it should show profitability improvements, increasing volume of funds flowing from savers to borrowers, and better-quality services for consumers (Sufian and Habibullah, 2009).

Sarkar and Rakshit (2023) investigated the macroeconomic factors influencing the profitability of public sector commercial banks in India from 2000 to 2017, using return on equity and net interest margin as profitability measures. Analysing a balanced panel of 20 public sector banks, the study showed that GDP growth, inflation, and unemployment significantly positively impact both net interest margin and return on asset. Conversely, financial crises have a strongly negative effect on all profitability measures. The impact of lending interest rates on return on equity and net interest margin is found to be insignificant. Overall, the study underscores the significant influence of macroeconomic factors, particularly growth rate, inflation, and unemployment, on the profitability of commercial banks in India, with robust results supporting the validity of these conclusions. Brahmaiah (2018) examined the profitability of 89 Indian commercial banks from 2005 to 2015 using return on assets and return on equity as metrics. The study found that both internal and external factors significantly affect the bank profitability. Positive internal factors include the strength of equity capital and operational efficiency, while the ratio of banking sector deposits to GDP is a beneficial external factor. The study also showed that there is a negative influence on profitability are credit risk, cost of funds, non-performing assets ratio, and consumer price index inflation. Additionally, GDP growth and inflation negatively relate to return on asset, whereas inflation positively affects return on equity. Farkasdi *et al.* (2021) investigated the factors influencing the profitability of commercial banks in Germany focusing on 7 banks listed in the DAX during 2017-2020. The results showed that asset size, capital adequacy, deposits, and non-interest income significantly positively impact profitability. Specifically, asset size, capital adequacy, and non-interest income individually have a significant positive effect, while deposits have a significant negative effect. Non-interest income is identified as the most dominant factor influencing profitability. Petria *et al.* (2015) investigated the determinants of bank profitability in the EU27 from 2004 to 2011, categorizing factors into internal (bank-specific) and external (industry-specific and macroeconomic) groups. The study showed that credit and liquidity risk, management efficiency, and business diversification are key internal factors, while market concentration/competition and economic growth are important external factors.

Jigeer and Koroleva (2023) examined what factor influence commercial banks in China to be profitable. The study highlighted important internal factors like bank size,

capital adequacy, and credit quality, underscoring the significance of effective management and strong capital structures in improving profitability. Furthermore, external factors such as regional GDP and inflation rates are identified as important factors. Pan *et al.* (2023) investigated the elements influencing the financial performance of commercial banks in the MENA region. Political stability, macroeconomic factors, and specific bank attributes like size and liquidity are key factors in determining profitability. The study also highlights the impact of regulatory conditions and market circumstances, pointing out that greater market dominance and less competition may result in higher profits as well as elevated risks. Widyarini and Marsoem (2021) analysed the determinants of banking profitability listed on the Indonesia stock exchange before and during COVID-19. The results indicated that capital adequacy ratio, net interest margin, loan to deposit ratio and Covid-19 had no effect on return on assets. Operational efficiency and non-performing loan had a negative and significant effect on return on assets. Chisongo and Kayombo (2023) evaluated the factors affecting the profitability of commercial banks in Zambia using data from 2010 to 2021, identifying that asset size, loan loss provisions, cost efficiency, liquidity, income diversification, and foreign currency activities impact profitability. However, only the cost to income ratio and loan loss provision ratio are statistically significant. Internal factors such as cost efficiency and risk management practices drive profitability, while macroeconomic variables like GDP growth, inflation, and interest rates have no significant effect. The findings suggest that banks should focus on improving cost efficiency and asset quality, while regulators should ensure adequate capital and liquidity buffers to maintain financial stability and promote economic growth.

Dao (2020) investigated the factors affecting the profitability of commercial banks in Asian developing countries, including Vietnam, Malaysia, and Thailand. The result showed that there is significantly negative influence of bank size on profitability on models of Vietnam and Thailand and no significant effect on the model of Malaysia. Meanwhile, the most controversial result comes up with the negative relationship between capital adequacy ratio and profitability indicators as well as the positive association between credit risk and banking profitability. Khan (2022) assessed the determinants of profitability of banks' operating in GCC (Gulf Cooperation Council) countries. The result showed bank size and GDP growth have a significant and positive association with return on assets. However, bank size and asset management have significant and positive impact, capital adequacy, financial risk, operating efficiency, and asset quality have a negative and significant impact on return on equity. Rifqah and Hassan (2019) analysed the relationship between bank's credit risk, liquidity, and capital adequacy towards its profitability in Indonesia. The main indicators used in this study are net interest margin, return on asset, non-performing loan ratio, loan to deposit ratio, and capital adequacy ratio. The result of the study showed that there is a significant negative relationship of net interest margin and return on asset with non-performing loan ratio, loan to deposit ratio, and capital adequacy ratio.

In the context of Nepal, Shrestha (2023) assessed the determinants of the profitability of commercial banks operating in Nepal. Based on the result of panel data analysis, the study revealed that bank-specific and macroeconomic factors play an essential role in determining profitability. Similarly, the study found that liquidity, management efficiency, assets quality, consumer price index and interest rate substantially influence the profitability of banks operating in Nepal. The study concluded that the bank management should improve its liquidity, efficiency of management, and quality of assets to improve profitability. Likewise, the bank management can benefit from increasing consumer price index and interest rate to

improve profitability. Gurung and Gurung (2022) found that loan to deposit, known as credit-deposit ratio, has a significant positive impact on the return on assets and net interest margin of commercial banks. The growth of economic activities of the nation measured by gross domestic product growth, significantly influence profits. It implies that the increase in the nation's economic activities leads to escalate the size of loans and advances and eventually earnings of the banks. However, non-performing assets weakly influence the return on assets, but it has a significant negative effect on the equity return.

Mishra *et al.* (2021) found that there is a negative relation of return on asset and return on equity with loan ratio, deposit ratio and capital ratio, while there is positive relation with bank size and inflation. However, in case of net interest margin, bank size, loan ratio, deposit ratio and inflation exhibit a positive relation while the capital ratio shows the negative relationship with net interest margin. Mishra and Kandel (2023) investigated the determinants of operational performance in Nepalese commercial banks, with a particular focus on the roles of capital adequacy, cost-to-income ratio, and various performance indicators. The study emphasized on the importance of maintaining optimal levels of capital adequacy and cost-to-income ratio to enhance profitability. A positive relationship between bank size, nonperforming loans ratio, liquidity position, and overall performance has been observed. Prudent management of these factors, along with effective liquidity management and a balanced capital ratio, is crucial for improving returns on assets.

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

The major objective of the study is to examine the determinants of profitability in the context of Nepalese commercial banks. Specifically, it examines the relationship of firm size, capital adequacy ratio, total debt to total equity, total equity to total asset, total debt to total asset, non-performing loan with return on assets and return on equity in the context of Nepalese commercial banks.

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

2. Methodological aspects

The study is based on the secondary data which were collected from 10 Nepalese commercial banks from 2013/14 to 2022/23, leading to a total of 100 observations. The study employed convenience sampling method. The main sources of data collected from the Bank Supervision Report published by Nepal Rastra Bank (NRB), and annual reports of the selected commercial banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

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

S. N.	Name of the banks	Study period	Observations
1	Everest Bank Limited	2013/14-2022/23	10
2	Prime Commercial Bank Limited	2013/14-2022/23	10
3	Citizens Bank International Limited	2013/14-2022/23	10
4	Nepal SBI Bank Limited	2013/14-2022/23	10
5	Agricultural Development Bank Limited	2013/14-2022/23	10
6	NMB Bank Limited	2013/14-2022/23	10
7	NIC Asia Bank Limited	2013/14-2022/23	10
8	Standard Chartered Bank Nepal Limited	2013/14-2022/23	10
9	Siddhartha Bank Limited	2013/14-2022/23	10
10	Nabil Bank Limited	2013/14-2022/23	10
Total number of observations			**100**

Thus, the study is based on 100 observations.

The model

The model used in this study assumes that profitability of banks depends upon different bank specific factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are firm size, capital adequacy ratio, total debt to total equity, total equity to total assets, total debt to total assets, non- performing loan. Therefore, the models take the following forms

$$ROA = \beta_0 + ß_1 FS + ß_2\ CAR + ß_3\ TD/TE + ß_4\ TE/TA + ß_5\ TD/TA + ß_6\ NPL + e_{it}$$

$$ROE = \beta_0 + ß_1 FS + ß_2\ CAR + ß_3\ TD/TE + ß_4\ TE/TA + ß_5\ TD/TA + ß_6\ NPL + e_{it}$$

Where,

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

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

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

FS = Firm size as measured by the total assets of the respected banks, Rs. in billions.

TD/TE= Total debt to total equity ratio, in percentage.

TE/TA = Total equity to total asset ratio, in percentage.

TD/TA = Total debt to total asset ratio, in percentage.

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

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

Firm size

Bigger banks typically have more diversified portfolios in terms of loans, investments, and geographic presence. This diversification helps in spreading risk, reducing the impact of any single event or economic downturn on overall profitability. Mishra et al. (2023) investigated the determinants of operational performance in Nepalese commercial banks. The study found a positive relationship between bank size and profitability measures. Jigeer *et al.* (2023) revealed that larger bank size helps in improving profitability. Khan (2022) assessed

the determinants of profitability of banks' operating in GCC (Gulf Cooperation Council) countries. The result showed bank size has a significant positive association with return on assets and return on equity. Based on it, this study develops the following hypothesis:

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

Capital adequacy ratio

Holding a higher capital adequacy ratio means that a bank retains more capital as a cushion against potential losses. This capital could otherwise be invested in higher-yielding assets. The opportunity cost of holding this capital can reduce the bank's profitability since it is not being used to generate income. Alnajjar and Othman (2021) explored the impact of capital adequacy ratio on Islamic banks' performance in selected MENA countries. The study also found that there is a statistically negative significant influence of capital adequacy ratio on both performance indicators return on asset and return on equity in the commercial Islamic banks in the selected MENA countries. Hersugondo *et al.* (2021) examined the role of non-performing asset, capital, adequacy, and insolvency risk on bank performance in Indonesia. The result of the study showed that capital adequacy has a significant negative impact on bank performance. Based on it, this study develops the following hypothesis:

H_2: There is a negative relationship between capital adequacy ratio and bank profitability.

Total debt to total equity

Higher leverage means a bank is using more borrowed funds relative to its equity. This can amplify the return on equity (ROE) because any profits generated are spread over a smaller equity base. If a bank can earn a higher return on its investments than the cost of its debt, leveraging can significantly boost profitability. Adeusi *et al*. (2014) revealed that the credit risk indicators identified which included debt-equity ratio, and managed fund needs to be managed in a better way to achieve better banks financial performance. Neupane (2013) investigated the change in efficiency and productivity of banking industry. The Tobit regression model found a positive relationship between debt-to-equity ratio and efficiency. Further, profitable banks with lower leverage are found to be more efficient. Based on it, this study develops the following hypothesis:

H_3: There is a positive relationship between total debt to total equity and bank profitability.

Total equity to total assets

Lee and Iqbl (2018) investigated the factors influencing the profitability of listed commercial banks in Bangladesh. The study revealed that bank equity to total assets positively affect bank performance. Adeusi *et al*. (2014) evaluated the association of risk management practices and banks' financial performance in Nigeria. The study recommended that the credit risk indicators identified which included debt-equity ratio, and managed fund needs to be managed in a better way to achieve better banks financial performance. Based on it, this study develops the following hypothesis:

H_4: There is a positive relationship between total equity to total assets and bank profitability.

Total debt to total assets

Lee and Iqbl (2018) investigated the factors influencing the profitability of listed commercial banks in Bangladesh. The study revealed that factors such as the ratio of total debt to total assets positively affect bank performance. A higher leverage ratio may be interpreted by the market as a sign that the bank is confident in its ability to generate returns that exceed the cost of debt. This can attract more investors and depositors, further enhancing

profitability. Abor (2005) found that there is a positive relationship between short-term debt to total assets and return on equity. Based on it, this study develops the following hypothesis:

H_5: There is a positive relationship between total debt to total assets and bank profitability.

Non-performing loan

Rifqah and Hassan (2019) analysed the relationship between bank's credit risk, liquidity, and capital adequacy towards its profitability in Indonesia. The result showed that there is a significant negative relationship between net interest margin and return on asset and non-performing loan ratio. Widyarini and Marsoem (2021) analysed the determinants of banking profitability listed on the Indonesia stock exchange before and during Covid-19. The results indicated that non-performing loan has a negative and significant effect on return on assets. Based on it, this study develops the following hypothesis:

H_6: There is a negative relationship between non-performing loan and bank profitability.

3. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2013/14 to 2022/23.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), FS (Firm size as measured by the total assets of the respected banks, Rs. in billions), TD/TE (Total debt to total equity ratio, in percentage), TE/TA (Total equity to total asset ratio, in percentage), TD/TA (Total debt to total asset ratio, in percentage), and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.47	3.56	1.57	0.50
ROE	1.82	91.51	16.83	11.38
TA	1.31	364.09	140.17	79.80
CAR	7.49	22.99	14.17	2.55
TD/TE	4.19	56.00	10.38	9.72
TE/TA	0.04	10.10	0.90	2.39
TD/TA	0.49	3.85	1.02	0.58
NPL	0.06	5.82	1.50	1.25

Source: SPSS output

Correlation analysis

Having indicated the descriptive statistics, the Pearson's correlation coefficient has been completed and result has been shown in Table 3.

Table 3

Pearson's correlation coefficients matrix

This table shows the Pearson's correlation coefficients of dependent and independent variables of 10 Nepalese commercial banks for the study period from 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), FS (Firm size as measured by the total assets of the respected banks, Rs. in billions), TD/TE (Total debt to total equity ratio, in percentage), TE/TA (Total equity to total asset ratio, in percentage), TD/TA (Total debt to total asset ratio, in percentage), and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage).

Variables	ROA	ROE	TA	CAR	TD/TE	TE/TA	TD/TA	NPL
ROA	1							
ROE	0.685**	1						
TA	0.417**	0.162	1					
CAR	0.407**	0.311**	0.033	1				
TD/TE	-0.210*	-0.001	0.381**	-0.277**	1			
TE/TA	-0.140	0.002	0.186	-0.120	0.657**	1		
TD/TA	-0.151	0.024	0.403**	-0.149	0.965**	0.679**	1	
NPL	-0.024	-0.204*	0.048	0.085	-0.205*	-0.150	-0.191	1

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

Table 3 shows that there is positive relationship between capital adequacy ratio and return on assets. It indicates that higher the capital adequacy ratio, higher would be return on assets. Similarly, there is a positive relationship between total assets and return on assets. It implies that increase in total assets leads to increase in return on assets. In contrast, total debt to total equity ratio has a negative relationship with return on assets. It indicates that higher the total debt to total equity ratio, lower would be the return on assets. In addition, total equity to total assets ratio has a negative relationship with return on assets. It indicates that increase in total equity to total assets ratio leads to decrease in return on assets. Moreover, there is a negative relationship between total debt to total assets ratio and return on assets. It means that increase in total debt to total assets ratio leads to decrease in return on assets. Furthermore, non-performing loans have negative relationship with return on assets. It indicates that higher the non-performing loans, lower would be the return on assets.

Likewise, the result shows that capital adequacy ratio has a positive relationship with return on equity. It indicates that higher the capital adequacy ratio, higher would be return on equity. Similarly, there is a positive relationship between total assets and return on equity. It implies that increase in total assets leads to increase in return on equity. In contrast, total debt to total equity ratio has a negative relationship with return on equity. It indicates that higher the total debt to total equity ratio, lower would be the return on equity. In addition, total equity to total assets ratio has a positive relationship with return on equity. It indicates that increase in total equity to total assets ratio leads to increase in return on equity. Moreover, there is a positive relationship between total debt to total assets ratio and return on equity. It means that increase in total debt to total assets ratio leads to increase in return on equity. Furthermore, non-performing loans have negative relationship with return on assets. It indicates that higher the non-performing loans, lower would be the return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4 and Table 5. More specifically, Table 4 shows the regression results of total assets, capital adequacy ratio, total debt to total equity, total equity to total assets, and total debt to total assets and non-performing loan with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of total assets, capital adequacy ratio, total debt to total equity, total equity to total assets, and total debt to total assets and non-performing loan with return on assets.

The results are based on panel data of 10 commercial banks with 100 for the study period from 2013/14 to 2022/23 by using the linear regression model and the model is $ROA = \beta_0 + ß_1 FS + ß_2 CAR + ß_3 TD/TE + ß_4 TE/TA + ß_5 TD/TA + ß_6 NPL + e_{it,}$ 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 capital to total risk weighted exposure, in percentage), FS (Firm size as measured by the total assets of the respected banks, Rs. in billions), TD/TE (Total debt to total equity ratio, in percentage), TE/TA (Total equity to total asset ratio, in percentage), TD/TA (Total debt to total asset ratio, in percentage), and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		TA	CAR	TD/TE	TE/TA	TD/TA	NPL			
1	1.945 (20.644)**	0.125 (4.546)**						0.166	0.464	20.670
2	0.426 (1.614)		0.081 (4.407)**					0.157	0.466	19.424
3	1.687 (23.013)**			-0.011 (2.127)*				0.034	0.499	4.525
4	1.599 (29.565)**				-0.030 (1.399)			0.010	0.506	1.957
5	1.708 (16.657)**					-0.132 (1.516)		0.013	0.505	2.298
6	1.587 (19.902)**						-0.010 (0.236)	0.010	0.510	0.056
7	0.771 (3.173)**	0.154 (5.271)**	0.084 (5.146)*					0.338	0.413	26.260
8	0.678 (2.600)*	0.148 (5.218)**	0.089 (5.196)**	0.005 (0.991)				0.338	0.411	17.831
9	0.641 (2.432)*	0.159 (5.293)**	0.091 (5.268)**	0.009 (1.390)	-0.023 (0.983)			0.338	0.418	13.610
10	0.638 (2.423)*	0.164 (5.371)**	0.082 (4.241)**	-0.009 (0.495)	-0.028 (1.184)	-0.324 (1.014)		0.338	0.4138	11.097
11	0.652 (2.419)*	0.157 (5.260)**	0.082 (4.222)**	-0.010 (0.509)	-0.028 (1.181)	-0.324 (1.010)	-0.009 (0.272)**	0.331	0.4158	9.168

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 asset is the dependent variable.

Table 4 shows that the beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is similar to the findings of Alnajjar and Othman (2021). Similarly, the beta coefficients for firm size are positive with return on assets. It indicates that firm size has a positive impact on return on assets. This finding is inconsistent with the findings of Jigeer *et al.* (2023). Likewise, the beta coefficients for total debt to total equity ratio are negative with return on assets. It indicates that total debt to total equity ratio has a negative impact

on return on assets. This finding is similar to the findings of Adeusi *et al*. (2014). Further, the beta coefficients for total equity to total assets ratio are negative with return on assets. It indicates that total equity to total assets ratio has a negative impact on return on assets. This finding is consistent with the findings of Lee and Iqbl (2018). In addition, the beta coefficients for total debt to total assets ratio are negative with return on assets. It indicates that total debt to total assets ratio has a negative impact on return on assets. This finding is similar to the findings of Abor (2005). Moreover, 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 contradicts with the findings of Rifqah and Hassan (2019).

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

Table 5

Estimated regression results of total assets, capital adequacy ratio, total debt to total equity, total equity to total assets, and total debt to total assets and non-performing loan with return on equity

The results are based on panel data of 10 commercial banks with 100 for the study period from 2013/14 to 2022/23 by using the linear regression model and the model is ROE = β_0 + $ß_1$FS + $ß_2$ CAR + $ß_3$ TD/TE + $ß_4$ TE/TA + $ß_5$ TD/TA + $ß_6$ NPL + $e_{it,}$ where the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), FS (Firm size as measured by the total assets of the respected banks, Rs. in billions), TD/TE (Total debt to total equity ratio, in percentage), TE/TA (Total equity to total asset ratio, in percentage), TD/TA (Total debt to total asset ratio, in percentage), and NPL (Non-performing loan ratio as measured by the ratio of non-performing loan to total loans, in percentage).

Model	Intercept	Regression coefficients of						Adj. R_bar^2	SEE	F-value
		TA	CAR	TD/TE	TE/TA	TD/TA	NPL			
1	20.082 (8.762)**	0.184 (1.628)						0.016	11.296	2.650
2	-2.804 (0.455)		1.386 (3.241)**					0.088	10.879	10.503
3	16.837 (10.027)**			-0.014 (0.001)				0.010	11.447	0.021
4	16.836 (13.757)**				0.210 (0.124)			0.010	11.446	0.022
5	16.355 (7.041)**					0.470 (0.238)		0.010	11.445	0.057
6	14.065 (8.041)**						-1.847 (2.063)*	0.032	11.209	4.258
7	00291 (0.046)	0.017 (1.820)	1.411 (3.338)**					0.109	10.756	7.032
8	-4.226 (0.632)	0.204 (2.444)*	1.669 (3.795)**	-0.233 (1.868)				0.131	10.614	5.971
9	-4.770 (0.703)	0.207 (2.481)*	1.694 (3.819)**	-0.292 (1.787)	0.336 (0.561)			0.125	10.656	4.525
10	-4.742 (0.696)	0.189 (2.412)*	1.790 (3.584)**	-0.491 (0.992)	0.277 (0.450)	3.517 (0.425		0.117	10.702	3.625
11	-7.195 (1.171)	0.210 (2.795)**	1.782 (3.669)**	-0.565 (1.172)	0.263 (0.439)	3.592 (0.447)	-2.166 (2.525)*	0.165	10.409	4.256

Notes:

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

Table 5 shows that the beta coefficients for 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 Widyarini and Marsoem (2021). Similarly, the beta coefficients for firm size are positive with return on equity. It indicates that firm size has a positive impact on return on equity. This finding is inconsistent with the findings of Khan (2022). Likewise, the beta coefficients for total debt to total equity ratio are negative with return on equity. It indicates that total debt to total equity ratio has a negative impact on return on equity. This finding is similar to the findings of Neupane (2013). Further, the beta coefficients for total equity to total assets ratio are positive with return on equity. It indicates that total equity to total assets ratio has a positive impact on return on equity. This finding is consistent with the findings of Lee and Iqbl (2018). In addition, the beta coefficients for total debt to total assets ratio are positive with return on equity. It indicates that total debt to total assets ratio has a positive impact on return on equity. This finding is similar to the findings of Adeusi *et al*. (2014). Moreover, 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 contradicts with the findings of Widyarini and Marsoem (2021).

4. Summary and conclusion

A sound, profitable, competent and well managed banks enable both the economy and the country to stay competitive and able to withstand any negative shocks. Commercial banks are the main pillar of the financial system as it provides different opportunity and services to clients. The importance of the banking sectors is immense in the progress and richness of any state. The economic development and prosperity come from the well-rounded developed and perfect banking system.

This study attempts to examine the determinants of profitability in the context of Nepalese commercial banks. The study is based on secondary data of 10 commercial banks with 100 observations for the period from 2013/14 to 2022/23.

The major conclusion of this study is that firm size and capital adequacy ratio have a positive impact on return on assets and return on equity. However, total debt to total equity and non-performing loans have a negative impact on return on assets and return on equity. The study showed that higher levels of debt and non-performing loans can reduce profitability, while an increase in total assets lead to better asset utilization or improved profitability. The study also concluded that there is an essential role of capital adequacy in enhancing financial performance, particularly in boosting return on assets and return on equity. It also emphasizes the need for careful management of debt levels and asset quality to maximize returns. Likewise, the study also concluded that net interest margin followed by capital adequacy ratio is the most influencing factor that explains the changes in the return on asset and return on equity in the context of Nepalese commercial banks.

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