

Impact of Financial Ratios, Operational Efficiency and Non-Performing Loan on the Profitability of Nepalese Commercial Banks

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Abstract

The study examines the impact of financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese commercial banks. Return on assets and Return on equity are selected as the dependent variables. The selected independent variables are leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency. The study is based on secondary data of 20 commercial banks with 120 observations for the period from 2015/16 to 2020/21. 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 financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese commercial banks.

The study showed that leverage and operating efficiency has a negative impact on return on assets. It indicates that increase in leverage and operating efficiency leads to decrease in return on assets. Similarly, liquidity ratio, net interest margin, capital adequacy ratio and non-performing loan has a positive impact on return on assets. It indicates that higher the liquidity ratio, net interest margin, capital adequacy ratio and non-performing loan, higher would be the return on assets. Likewise, leverage, liquidity ratio and net interest margin has positive impact on return on equity. It indicates that increase in leverage, liquidity ratio and net interest margin leads to increase in return on equity. Furthermore, capital adequacy ratio, non-performing loan and operating efficiency has a negative impact on return on equity. It indicates that increase in capital adequacy ratio, non-performing loan and operating efficiency leads to decrease in return on equity.

Key words: Leverage, return on assets, return on equity, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency.

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I. Introduction

Banking sector plays a pivotal role as it ensures efficient flow of financial resources from savers to borrowers. Since banks work as a financial intermediary of financial system, efficiency & smooth performance lead to economic growth. Therefore, sound performance of commercial banks is what a country needs for healthy economic growth. Globally, the banking sector has undergone significant transformations for the past decades with banks activities and performance being influenced by both internal and external factors. Banks generally contribute to economic growth through their intermediation functions and the financing of economic activities (Unvan & Yakubu, 2020). The success and failure of a bank are measured by profitability performance. The strong profitability of a bank shows a higher capacity to earn profit and a bigger contribution to the economic growth of a country (Adiatmayani & Panji, 2021). The profitability ratio is the main measure of company performance. If a company can generate large profits with increasing profit growth over the years, it can say that it is good. The high level of profitability describes the good performance of a company, which means that the bank has been operating effectively and efficiently (Langodai & Lutfillah, 2019).

Isayas (2022) examined in today's economy, banks play significant and irreplaceable roles in the growth of financial services, which ultimately leads to the overall success of the economy of a country. The study revealed that firm size, liquidity ratio, asset tangibility, capital adequacy, leverage and real GDP growth rate have a positive and statistically significant effect on the profitability of banks. Bunyaminu *et al.* (2021) implicated the impact of financial leverage on profitability of recapitalized banks in Ghana. The results found that leverage exerts a significant negative effect on banks' profits regardless of the proxy of profitability. Similarly, Thinh *et al.* (2022) asserted that profitability is a matter of concern for all economic organizations, including banks. The results showed that liquidity has a positive relationship with the profitability. Likewise, Bintara (2020) implicated this research was conducted with the aim of to analyze the effect of working capital turnover on profitability, to analyze the effect of liquidity on profitability and to analyze the effect of leverage on profitability. The results showed that working capital turnover has no effect on profitability, liquidity has no effect on profitability and leverage has a negative effect on profitability.

Soesetio *et al.* (2022) asserted whether the profitability of small banks is shaped by bank-specific and macro-economic factors. The results found that liquidity and loan to deposit ratio positively affects small banks profitability in Indonesia. Meanwhile, size, deposit to asset ratio, capital adequacy ratio, and GDP growth negatively affects profitability. According to Abate and Mesfin (2019) explored the bank-specific, industry-specific and macro-economic factors that affect bank profitability of nine commercial banks in Ethiopia, during the period of 2007-2016. The study revealed that capital adequacy, leverage, liquidity, and ownership have statistically significant and positive relationship with banks' profitability. On the other hand, operational efficiency, GDP, inflation and interest rate have a negative and statistically significant relationship with banks' profitability. Furthermore, Setiawati *et al.* (2022) assessed an Islamic bank or commonly referred to as an interest-free bank, is an operational financial/banking institution. The results showed that the capital adequacy ratio (CAR) and net interest margin (NIM) had a positive and significant effect on

profitability. Meanwhile, non-performing finance (NPF) has a negative and insignificant effect on profitability. Moreover, Surtikanti *et al.* (2022) implicated the influence of capital adequacy ratio and net interest margin to Profitability (Return on Asset) in listed Foreign Exchange Commercial Banks in Indonesia Stock Exchange from 2011 to 2015. The study found that the variable of capital adequacy ratio significantly influences the profitability (Return on Asset) while net interest margin variable significantly influences profitability (Return On Asset).

Widyakto *et al.* (2021) assessed the impact of NIM, LDR and NPL on the productivity of banks. The study revealed that NIM incorporates a critical positive impact on ROE. NPL contains a noteworthy negative impact on ROE. In addition, Susilawati and Nurulrahmatiah (2021) analyzed the financial performance of a bank can be measured through ROA. The results showed that NPL has a significant effect on ROA, while LDR does not affect ROA. Also, this study revealed that NIM has a significant effect on ROA. Likewise, Lukorito *et al.* (2014) analyzed the financial sector in Kenya is dominated by commercial banks which have reported significant growth and improved financial performance. The study found that Liquidity has statistically significant and positive relationship with banks' profitability.

Similarly, Sriyono and Nabellah (2022) analyzed the increasing Profitability is necessary for a business so that business activities can still exist. The study revealed that the level of capital adequacy has a positive effect on profitability. Likewise, Djaya and Yanuarti (2021) estimated the influence of Capital Adequacy Ratio and Non-Performing Loan on profitability of Commercial Banks. The results showed that capital adequacy ratio had positive influence on return on assets but not statistically significant. Furthermore, Islam *et al.* (2020) analyzed the one of the main challenges faced by commercial banks in Bangladesh nowadays is credit risk. The study revealed that capital adequacy ratio and Leverage ratio have a significant negative impact on the performance of banks. Moreover, Triyanto and Mukhlis (2022) analyzed the effect of mudharabah, musyarakah, murabahah, and non-performing financing (NPF) financing on the profitability of sharia commercial banks. The study revealed that non-performing financing variables have a significant effect on ROA at the 5% level.

According to Collaku and Aliu (2021) analyzed the impact of nonperforming loans on Kosovo banks' profitability over a time. The results revealed that the effect of nonperforming loans on the profitability is statistically significant and shows that for each 1% increase in NPL, the Return of Assets decreases by 0.19%, holding other variables constant. Similarly, Do *et al.* (2020) asserted the profit always be the top priority of banking operation over the years. The study found that non-performing loans have negative impact on the bank's profitability. Likewise, Gabriel *et al.* (2019) examined the effect of non-performing loans on the financial performance of commercial banks in Nigeria. The result showed that non-performing loans to total loans ratio (NPL/TLR) and cash reserve ratio (CRR) had statistically negative significant effect on return on asset (ROA). Furthermore, Kingu and Gwahula (2018) examined the impact of Non-performing loans on banks profitability using information asymmetry theory and bad management hypothesis. The study found that occurrence of non-performing loans is negatively associated with the level of profitability in commercial banks in Tanzania. Moreover, Hasmiana and Pintor (2022)

examined to partially analyze partially the effect of financial risk, capital structure, and liquidity on profitability through operational efficiency at State-Owned Banks and Private Commercial Banks. The results showed that the financial risk, capital structure, liquidity, and operational efficiency partially had a significant effect on profitability.

Phan (2020) analyzed the factors affecting the profitability of listed commercial banks in Vietnam. The results showed that operating efficiency, loans size, retail loans ratio, state ownership, inflation rate, and GDP growth are factors that have a positive impact on profitability. In addition, Adam *et al.*(2018) asserted the influence of company size, liquidity and operational efficiency on bank profitability with problem credit risk as a moderating variable at commercial banks. The study found that liquidity did not affect profitability, operational efficiency negatively affected profitability. Similarly, Ebenezer *et al.* (2017) examined the bank-specific and macroeconomic determinants of banks profitability in Nigeria. The results showed that capital adequacy and liquidity have a positive and significant effect on bank profitability. However, efficiency ratio has a negative and significant effect on bank profitability. Likewise, Erina and Lace (2013) examined the impact of the external and internal factors of bank performance on the profitability indicators of the Latvian commercial banks. The study revealed that profitability has had a positive effect on operational efficiency measured by ROA and ROE.

In the context of Nepal, Gurung and Gurung (2022) implicated to observe the various aspects shaping commercial bank profitability in Nepal. The study revealed that non-performing assets weakly influence the return on assets, but it has a significant negative effect on the equity return. Niroula and Singh (2021) examined the effect of liquidity on financial performance of commercial banks in Nepal. The study found that the variable CAR has positive and significant effect on ROA but negative and significant effect on ROE. Also, the finding shows that the LR has positive and significant effect on ROA and negative and significant effect on ROE. Similarly, Oli (2021) assessed the determinants of return on assets, net profit margin, and earnings per share in Nepalese commercial banks. The study revealed that debt to assets ratio, long term debt ratio, debt to equity ratio, interest coverage ratio, and liquidity ratio have a positive relationship with return on assets, net profit margin, and earning per share. Likewise, Bhattarai (2020) evaluated the non-performing loan (NPL) is major problem in banking industry. The results revealed that the NPL, CAR, LIQ have significant and negatively associated with ROE.

Pradhan and Parajuli (2017) asserted the effect of capital adequacy and cost income ratio on the performance of Nepalese commercial banks. The study showed that there is negative relationship of capital adequacy, cost income ratio, equity capital to total assets ratio and liquidity ratio with return on assets. Similarly, the study observed that there is a negative relationship of liquidity ratio with return on equity.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese 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 main purpose of the study is to analyze the impact of financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency with return on assets and return on equity of Nepalese commercial banks.

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

II. Research Methodology

The study is based on the secondary data, which were gathered from 20 Nepalese commercial banks from 2015/16 to 2020/21, leading to a total of 120 observations. 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 banks selected for the study along with the study period and number of observations

| S. N. | Name of the banks | Study period | Observations |
|----------------------------|---------------------------------------|-------------------|--------------|
| Public Banks | | | |
| 1 | Nepal Bank Limited | 2015/16 - 2020/21 | 6 |
| 2 | Agricultural Development Bank Limited | 2015/16 - 2020/21 | 6 |
| Joint Venture Banks | | | |
| 3 | Nabil Bank Limited | 2015/16 - 2020/21 | 6 |
| 4 | Nepal SBI Bank limited | 2015/16 - 2020/21 | 6 |
| 5 | NMB Bank Limited | 2015/16 - 2020/21 | 6 |
| 6 | Himalayan Bank Limited | 2015/16 - 2020/21 | 6 |

| Private Banks | | | |
|-------------------------------------|---------------------------------|-------------------|------------|
| 8 | Global IME Bank Limited | 2015/16 - 2020/21 | 6 |
| 9 | Siddhartha Bank Limited | 2015/16 - 2020/21 | 6 |
| 10 | NIC Asia Bank Limited | 2015/16 - 2020/21 | 6 |
| 11 | Machhapuchchhre Bank Limited | 2015/16 - 2020/21 | 6 |
| 12 | Sanima Bank Limited | 2015/16 - 2020/21 | 6 |
| 13 | Sunrise Bank Limited | 2015/16 - 2020/21 | 6 |
| 14 | Mega Bank Nepal Limited | 2015/16 - 2020/21 | 6 |
| 15 | Nepal Investment Bank Limited | 2015/16 - 2020/21 | 6 |
| 16 | Century Commercial Bank Limited | 2015/16 - 2020/21 | 6 |
| 17 | Civil Bank Limited | 2015/16 - 2020/21 | 6 |
| 18 | Kumari Bank Limited | 2015/16 - 2020/21 | 6 |
| 19 | Prime Commercial Bank Limited | 2015/16 - 2020/21 | 6 |
| 20 | Laxmi Bank Limited | 2015/16 - 2020/21 | 6 |
| Total number of observations | | | 120 |

The Model

The model used in this study assumes that profitability depends on financial ratio, operational efficiency and non-performing loan. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables in this study are leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency. The following model equations are designed to test the hypothesis:

$$ROA = \beta_0 + \beta_1 LEV + \beta_2 LQR + \beta_3 NIM + \beta_4 CAR + \beta_5 NPL + \beta_6 OE + e_{it}$$

$$ROE = \beta_0 + \beta_1 LEV + \beta_2 LQR + \beta_3 NIM + \beta_4 CAR + \beta_5 NPL + \beta_6 OE + e_{it}$$

Where,

ROA= Return on assets is measured as net profit to total assets, in percentage.

ROE= Return on equity is measured as net profit to total equity, in percentage.

LEV= Leverage ratio is measured as the total debt to total assets, in percentage.

LQR= Liquidity is measured as liquid assets to total assets, in percentage.

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

CAR= Capital adequacy ratio is measured as total capital to risk weighted assets, in percentage.

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

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

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

Leverage

Leverage basically entails how much firms collateralize their assets by adopting outside funds. Bose et al. (2017) defined leverage ratio as the percentage of total debt divided by total assets. Athanasoglou et al. (2008) argue that lower leverage (higher equity) leads to greater ROA but lower ROE. Karim *et al.* (2022) revealed that leverage ratios are negatively related to profitability and market return. Similarly, Sarker and Islam (2021) found that bank's capital structure is negatively associated with profitability and vice versa. Likewise, Alarussi and Alhaderi (2018) concluded that there is negative relationship between both leverage ratio and profitability. Furthermore, Bunyaminu *et al.* (2021) showed that leverage exerts a significant negative effect on banks' profits regardless of the proxy of profitability.

H₁: There is a negative relationship between leverage and profitability.

Liquidity ratio

Liquidity is used to measure a bank's ability to meet its short-term obligations at maturity or when billed. Liquid assets are cash and assets that can be converted to cash quickly if needed to meet financial obligations. Adelopo *et al.* (2022) revealed a positive and significant association between liquidity level and bank performance. Similarly, Al Zaidanin and Al Zaidanin (2021) analyzed that the liquidity ratio have a very weak positive relationship on the return on assets. Likewise, Soesetio *et al.* (2022) showed that liquidity positively affects small banks profitability in Indonesia. Moreover, Almaqtari *et al.* (2019) found that liquidity ratio are found to have a significant positive impact on ROE.

H₂: There is a positive relationship between liquidity ratio and profitability.

Net interest margin

Net interest margin (NIM) is the ratio of net interest income to total interest-earning assets, where the net interest income is the difference between interest revenues received from loans and interest costs paid for deposits. Le *et al.* (2022) found that net interest margin had a positive and significant effect on profitability. Similarly, Marlina (2022) concluded that NIM has a positive and insignificant effect on ROA. Likewise, Sukmadewi (2020) stated that net interest margin variables had a positive and significant effect on Return on Assets (ROA). Furthermore, Widyakto *et al.* (2021) revealed that NIM incorporates a critical positive impact on ROE.

H₃: There is a positive relationship between net interest margin and profitability.

Capital adequacy ratio

Capital Adequacy Ratio (CAR) 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. If the number of CAR ratios owned by the bank is getting bigger then the bank is able to face the risk of credit failure, and vice versa. Hersugondo *et al.* (2021) revealed that capital adequacy has a significant negative impact on bank performance. Similarly, Dao and Nguyen (2020) found that the most controversial result comes up with the negative relationship between capital adequacy ratio and profitability. Likewise, Al-Homaidi *et al.* (2020) showed that capital adequacy ratio have a negative significant impact on ROA. Furthermore, Islam *et al.* (2020) revealed that capital adequacy ratio have a significant negative impact on the performance of banks.

H₄: There is a negative relationship between capital adequacy ratio and profitability.

Non-performing loan

Non-performing Loan (NPL) is a comparison between the number of non-performing loans caused by the debtor and the amount of credit owned by the bank and then given to the debtor. The higher the NPL value, the worse it will be for banks due to the high number of non-performing loans that may lead to a decrease in ROA (Laryea *et al.*, 2016). Kwashie (2022) examined that non-performing loans have a negative impact on both measures of financial performance. Likewise, Safitri and Oktavia (2022) found that NPL has a negative and significant effect on ROA. Similarly, Bandara *et al.* (2021) showed that non-performing loans have negative and significant return on assets. Furthermore, Do *et al.* (2020) revealed that non-performing loans have negative impact on the bank's profitability.

H₅: There is a negative relationship between non-performing loan and profitability.

Operating efficiency

Operating efficiency is measured by the BOPO. BOPO is the ratio between total operating costs and total operating income of a bank (Endri, 2018). Operational efficiency illustrates the capability of management to regulate expenditures. Specific factors such as knowledgeable and skillful workers, utilization of capital (Gupta and Raman, 2020),

technological input (Mohapatra and Mohanty, 2017) all had a role in the firm's operational efficiency. Uddin (2022) examined that the direct effect operating efficiency has a negative and insignificant impact on profitability. Likewise, Anggraeni *et al.* (2022) implicated that operational efficiency ratio has a significant negative impact on both profitability. Furthermore, Adam *et al.* (2018) found that operational efficiency negatively affected profitability.

H₆: There is a negative relationship between operating efficiency and profitability.

III. Results and Discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2015/16 to 2020/21.

Table 2

Descriptive statistics

| Variables | Minimum | Maximum | Mean | Std. Deviation |
|-----------|---------|---------|-------|----------------|
| ROA | 0.48 | 3.64 | 1.54 | 0.492 |
| ROE | 4.94 | 22.17 | 13.06 | 3.77 |
| LEV | 80.41 | 93.96 | 88.01 | 2.53 |
| LQR | 5.17 | 21.95 | 12.31 | 3.43 |
| NIM | 1.87 | 5.60 | 3.11 | 0.65 |
| CAR | 10.20 | 20.41 | 13.82 | 2.07 |
| NPL | 0.01 | 4.60 | 1.24 | 1.02 |
| OE | 21.28 | 66.66 | 43.18 | 8.93 |

Source: SPSS output

This table shows the descriptive statistics of dependent and independent variables of 20 Nepalese commercial banks for the study period of 2015/16 to 2020/21. The dependent variables are ROA (Return on assets is measured as net profit to total assets, in percentage) and ROE (Return on equity is measured as net profit to total equity, in percentage). The independent variables are LEV (Leverage ratio is measured as the total debt to total assets, in percentage), LQR (Liquidity is measured as liquid assets to total assets, in percentage), NIM (Net interest margin as measured as net interest income to total assets, in percentage), CAR (Capital adequacy ratio is measured as total capital to

risk weighted assets, in percentage), NPL (Non-performing loan is measured as the non-performing loan to total loan, in percentage), OE (Operating efficiency measured as operating expenses to operating income, in percentage).

Correlation analysis

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

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 20 Nepalese commercial banks for the study period of 2015/16 to 2020/21. The dependent variables are ROA (Return on assets is measured as net profit to total assets, in percentage) and ROE (Return on equity is measured as net profit to total equity, in percentage). The independent variables are LEV (Leverage ratio is measured as the total debt to total assets, in percentage), LQR (Liquidity is measured as liquid assets to total assets, in percentage), NIM (Net interest margin as measured as net interest income to total assets, in percentage), CAR (Capital adequacy ratio is measured as total capital to risk weighted assets, in percentage), NPL (Non-performing loan is measured as the non-performing loan to total loan, in percentage), OE (Operating efficiency measured as operating expenses to operating income, in percentage).

| Variables | ROA | ROE | LEV | LQR | NIM | CAR | NPL | OE |
|-----------|----------|----------|----------|-------|---------|---------|-------|----|
| ROA | 1 | | | | | | | |
| ROE | 0.727** | 1 | | | | | | |
| LEV | -0.425** | 0.276** | 1 | | | | | |
| LQR | 0.010 | 0.045 | 0.044 | 1 | | | | |
| NIM | 0.614** | 0.284** | -0.495** | 0.094 | 1 | | | |
| CAR | 0.185* | -0.285** | -0.697** | 0.024 | 0.374** | 1 | | |
| NPL | 0.157 | -0.314** | -0.608** | 0.012 | 0.430** | 0.415** | 1 | |
| OE | -0.639** | -0.646** | 0.091 | 0.019 | -0.134 | 0.186* | 0.151 | 1 |

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

Table 3 shows that leverage is negatively correlated to return on assets. It indicates that increase in leverage leads to decrease in return on assets. Similarly, liquidity ratio has a positive relationship with return on assets. It indicates that increase in liquidity ratio leads to increase in return on assets. Likewise, net interest margin has a positive relationship with return on assets. It indicates that increase in net interest margin leads to increase in return on assets. Furthermore, there is a positive relationship between capital adequacy ratio and return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. In addition, non-performing loan has a positive relationship with return on assets. It means that increase the non-performing loan leads to increase in return on assets. Moreover, operating efficiency has a negative relationship with return on assets. It indicates that increase the operating efficiency leads to decrease in return on assets of Nepalese commercial banks.

Similarly, the result also shows that there is a positive relationship between leverage and return on equity. It indicates that increase the leverage leads to increase and return on equity. Similarly, liquidity ratio has a positive relationship with return on equity. It indicates that increase in liquidity ratio leads to increase in return on equity. Likewise, net interest margin has a positive relationship with return on equity. It indicates that increase in net interest margin leads to increase in return on equity. Furthermore, there is a negative relationship between capital adequacy ratio and return on equity. It indicates that increase in capital adequacy ratio leads to decrease in return on equity. In addition, non-performing loan has a negative relationship with return on equity. It means that increase the non-performing loan leads to decrease in return on equity. Moreover, operating efficiency has a negative relationship with return on equity. It indicates that increase the operating efficiency leads to decrease in return on equity of Nepalese commercial banks.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency with return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency with return on assets.

The results are based on panel data of 20 commercial banks with 160 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 LEV + \beta_2 LQR + \beta_3 NIM + \beta_4 CAR + \beta_5 NPL + \beta_6 OE + e_{it}$ where, the dependent variable is ROA (Return on assets is measured as net profit to total assets, in percentage). The independent variables are LEV (Leverage ratio is measured as the total debt to total assets, in percentage), LQR (Liquidity is measured as liquid assets to total assets, in percentage), NIM (Net interest margin as measured as net interest income to total assets, in percentage), CAR (Capital adequacy ratio is measured as total capital to risk weighted

assets, in percentage), NPL (Non-performing loan is measured as the non-performing loan to total loan, in percentage), OE (Operating efficiency measured as operating expenses to operating income, in percentage).

| Model | Intercept | Regression coefficients of | | | | | | Adj. R ² | SEE | F-value |
|-------|--------------------|----------------------------|------------------|-------------------|-------------------|------------------|---------------------|---------------------|-------------|------------|
| | | LEV | LQR | NIM | CAR | NPL | OE | | | |
| 1 | 8.847 (6.185)** | - 0.053 (5.107)** | | | | | | 0.174 | 0.4476 2 | 26.08 2 |
| 2 | 1.527 (9.033)** | | 0.001 (0.112) | | | | | 0.008 | 0.4945 9 | 0.012 |
| 3 | 0.087 (0.497) | | | 0.469 (8.453)* | | | | 0.372 | 0.4860 9 | 4.176 |
| 4 | 0.936 (3.105)* | | | | 0.044 (2.044)* | | | 0.026 | 0.4860 9 | 4.176 |
| 5 | 1.451 (20.525)* | | | | | 0.076 (1.725) | | 0.016 | 0.4885 0 | 2.975 |
| 6 | 3.067 (17.797)* | | | | | | -0.035 (9.015)** | 0.403 | 0.3806 1 | 81.27 9 |
| 7 | 8.817 (6.131)** | - 0.083 (5.098)** | 0.004 (0.345) | | | | | 0.168 | 0.4493 0 | 13.00 3 |
| 8 | 9.302 (8.629)** | - 0.073 (5.909)** | 0.005 (0.607) | | | | -0.033 (9.628)** | 0.533 | 0.3364 1 | 46.36 1 |
| 9 | 4.214 (3.934)** | - 0.028 (2.460)* | | 0.358 (8.070)* | | | -0.031 (11.114)* | 0.700 | 0.2696 6 | 93.67 2 |
| 10 | 3.720 (2.446)* | - 0.023 (1.525) | | 0.356 (7.970)* | 0.008 (0.459) | | -0.032 (10.511)* | 0.698 | 0.2705 8 | 69.82 8 |
| 11 | 8.902 (6.356)** | - 0.068 (4.275)** | 0.005 (0.584) | | | 0.018 (0.450) | -0.034 (9.380)** | 0.530 | 0.3375 7 | 34.58 2 |
| 12 | 7.447 (3.594)** | - 0.054 (2.511)* | 0.005 (0.504) | | 0.021 (0.953) | 0.023 (0.563) | -0.035 (9.070)** | 0.530 | 0.3377 1 | 27.82 5 |

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 liquidity ratio are positive with return on asset. It indicates that liquidity ratio has a positive impact on return on asset. This finding is similar to the findings of Thinh *et al.* (2022). The beta coefficients for net interest margin are positive with return on asset. It indicates that net interest margin has a positive impact on return on asset. This finding is similar to the findings of Le *et al.* (2022). Similarly, the beta coefficients for capital adequacy ratio are positive with return on asset. It indicates that capital adequacy ratio has a positive impact on return on asset. This finding is contradicts to the findings of Hersugondo *et al.* (2021) Likewise, the beta coefficients for non-performing loan are positive with return on asset. It indicates that non-performing loan has a positive impact on return on asset. This finding is inconsistency with the findings of Kwashie (2022). On the other hand, the beta coefficients for leverage are negative with return on asset. It indicates that leverage has a negative impact on return on asset. This finding is similar to the findings of Karim *et al.* (2022). Similarly, the beta coefficients for operating efficiency are negative with return on asset. It indicates that operating efficiency has a negative impact on return on asset. This finding is consistent with the findings of Anggraeni *et al.* (2022).

Table 5 shows the estimated regression results of leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency with return on equity of Nepalese commercial banks.

Table 5 shows that the beta coefficients for leverage are positive with return on equity. It indicates that leverage has a positive impact on return on equity. This finding is contradicts to the findings of Sarker and Islam (2021). Similarly, the beta coefficients for liquidity ratio are positive with return on equity. It indicates that liquidity ratio has a positive impact on return on equity. This finding is consistency to the findings of Al Zaidanin and Al Zaidanin (2021). Likewise, the beta coefficients for net interest margin are positive with return on equity. It indicates that net interest margin has a positive impact on return on equity. This finding is similar to the findings of Marlina (2022). Similarly, the beta coefficients for capital adequacy ratio are negative with return on equity. It indicates that capital adequacy ratio has a negative impact on return on equity. This finding is similar to the findings of Dao and Nguyen (2020). On the other hand, 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 Safitri and Oktavia (2022). Similarly, the beta coefficients for operating efficiency are negative with return on equity. It indicates that operating efficiency has a negative impact on return on equity. This finding is consistent with the findings of Uddin (2022).

Table 5

Estimated regression results of leverage, liquidity ratio, net interest margin, capital adequacy ratio, non-performing loan and operating efficiency with return on equity.

The results are based on panel data of 20 commercial banks with 160 observations for the period of 2013/14-2020/21 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 LEV + \beta_2 LQR + \beta_3 NIM + \beta_4 CAR + \beta_5 NPL + \beta_6 OE + e_{it}$ where, the dependent variable is ROE (Return on equity is measured as total equity to total assets, in percentage). The

independent variables are LEV (Leverage ratio is measured as the total debt to total assets, in percentage), LQR (Liquidity is measured as liquid assets to total assets, in percentage), NIM (Net interest margin as measured as net interest income to total assets, in percentage), CAR (Capital adequacy ratio is measured as total capital to risk weighted assets, in percentage), NPL (Non-performing loan is measured as the non-performing loan to total loan, in percentage), OE (Operating efficiency measured as operating expenses to operating income, in percentage).

| Model | Intercept | Regression coefficients of | | | | | | Adj. R ² | SEE | F-value |
|-------|----------------------|----------------------------|------------------|-------------------|--------------------|--------------------|---------------------|---------------------|---------------------|--------------------|
| | | LEV | LQR | NIM | CAR | NPL | OE | | | |
| 1 | -23.239 (1.997)* | 0.413 (3.122)* | | | | | | 0.068 | 3.6414 ₈ | 9.745 |
| 2 | 12.455 (9.627)** | | 0.050 (0.492) | | | | | 0.006 | 3.7849 ₉ | 0.242 |
| 3 | 7.903 (4.822)** | | | 1.661 (3.218)* | | | | 0.073 | 3.6328 ₃ | 10.35 ₄ |
| 4 | 20.263 (8.996)** | | | | -0.520 (3.230)* | | | 0.073 | 3.6317 ₄ | 10.43 ₁ |
| 5 | 14.520 (27.901)* | | | | | -1.167 (3.598)* | | 0.091 | 3.5967 ₄ | 12.94 ₃ |
| 6 | 24.852 (18.968)* | | | | | | -0.273 (9.183)** | 0.412 | 2.8935 ₃ | 84.32 ₂ |
| 7 | -23.500 (2.009)* | 0.410 (3.091)* | 0.037 (0.374) | | | | | 0.062 | 3.6548 ₃ | 4.907 |
| 8 | -45.580 (2.646)** | 0.610 (3.618)* | | 3.307 (6.475)* | -0.386 (2.000)* | | | 0.316 | 3.1192 ₃ | 19.36 ₇ |
| 9 | 16.131 (6.771)** | | 0.015 (0.166) | 2.648 (5.230)* | -0.829 (5.273)* | | | 0.240 | 3.2901 ₆ | 13.49 ₄ |
| 10 | -18.892 (1.076) | 0.316 (1.803) | | 3.671 (7.496)* | -0.404 (2.220)* | -1.349 (3.969)* | | 0.394 | 2.9380 ₀ | 20.31 ₁ |
| 11 | -50.211 (5.414) | 0.746 (7.412)* | | 2.986 (8.645)* | | -0.516 (2.088)* | -0.254 (11.479)* | 0.705 | 2.0482 ₁ | 72.19 ₆ |
| 12 | 20.814 (9.945)** | | 0.025 (0.381) | 2.593 (6.419)* | -0.398 (3.250)* | -1.261 (4.958)* | -0.209 (8.037)** | 0.598 | 2.3906 ₉ | 36.47 ₇ |

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.

IV. Summary and conclusion

Profitability means the ability to make profit from all the business activities of an organization, company, firm, or an enterprise. That means it shows how efficiently the management can make profit by using all the resources available in the market. Bank profitability attracts the interest of academics, economists, investors and policymakers. In identifying bank profit determinant is chances to evaluate which variable have more impact on profit, and important for management to make timely decisions.

This study attempts to analyze the impact of financial ratios, operational efficiency and non-performing loan on the profitability of Nepalese commercial banks. The study is based on secondary data of 20 commercial banks with 120 observations for the period from 2015/16 to 2020/21.

The study showed that leverage and operating efficiency have negative impact on return on assets. However, liquidity ratio, net interest margin, capital adequacy ratio and non-performing loan have positive impact on return on assets. Similarly, leverage, liquidity ratio and net interest margin have positive impact on return on equity. Likewise, capital adequacy ratio, non-performing loan and operating efficiency has a negative impact on return on equity. the study also concluded that net interest margin followed by operating efficiency is the most influencing factor that explains the changes in the return on assets of selected Nepalese commercial banks. Similarly, the study also concluded that non-performing loan followed by operating efficiency is the most influencing factor that explains the changes in the return on equity in context of selected Nepalese commercial banks.

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