Effect of Financial Risk, Capital Structure and Banking Liquidity on the Profitability of Nepalese Commercial Banks

Sangita Rana*

Abstract

This study examines the effect of financial risk, capital structure and banking liquidity on the profitability of Nepalese commercial banks. Return on asset and return on equity are selected as the dependent variables. Similarly, debt equity ratio, debt assets ratio, cash reserve ratio, credit to deposit, loan loss provision, non-performing loan and operational efficiency are selected as the independent variables. This study is based on secondary data of 16 commercial banks with 112 observations for the study period from 2015/16 to 2021/22. The data were collected from Banking and Financial Statistics published by Nepal Rastra Bank, annual reports of the selected commercial banks and reports published by Ministry of Finance. The correlation coefficients and regression models are estimated to test the significance and importance of financial risk, capital structure and banking liquidity on the profitability of Nepalese commercial banks.

The study showed that non-performing loans have a negative impact on return on assets and return on equity. It means that the higher the ratio of non-performing loans, lower would be the return on asset and return on equity. Likewise, there is a negative impact of operating efficiency with return on assets and return on equity. It implies that the increase in operating expenses leads to a decrease in return on assets and return on equity. Similarly, there is also a negative relationship of credit to deposit ratio with return on assets and return on equity. It indicates that increase in credit to deposit ratio leads to decrease in return on assets and return on equity. Further, loan loss provision has a positive impact on return on asset. This implies that increase in loan loss provision leads to increase in return on asset. However, cash reserve ratio has a positive impact on return on equity indicating that higher the level of cash reserve ratio, higher would be the return on equity of Nepalese commercial banks.

Keywords: return on asset, return on equity, debt equity ratio, debt assets ratio, cash reserve ratio, loan loss provision, non-performing loan, operational efficiency

1. Introduction

Banks are considered as one of the essential financial intermediates in any financial system as they affect the small investors, small and medium-

* Ms. Rana is a freelance researcher, Kathmandu, Nepal. E-mail: sangitarana121@gmail.com

sized (SMEs), and the overall economy which will affect economic growth (Elkmash, 2023). A bank is a financial institution that acts as an intermediary between those who provide funds and those who need them. One sector that uses bank funding to stimulate economic growth is the real sector. Hasmiana and Pintor (2022) stated that now that the bank's primary purpose has been established, it needs to be managed professionally in order to generate ongoing profits. Therefore, it is expected to maintain the continuity of the banking business while securing profits (profitability) in the management of the banking business. One way the bank does it is by raising money for the community and processing it in the form of loans. The banking sector of a country has enormous influence. The most important banking activity is to buy money by assembling public funds. Profitable and strong banking system promotes broader financial stability and increases the economy's resilience to adverse macroeconomic shocks. A healthy and sustainable profitability is important in maintaining the stability of the banking system and for sustainable economic growth in general (Tafri *et al.*, 2013). Taking risk is core to the Bank's business, and risks are an inevitable consequence of being in business (Mudanya and Muturi, 2018). The bank's aim is, therefore, to achieve an appropriate balance between risk and return and minimize potential adverse effects on its performance. Dynamic business practices and demanding regulatory requirements mean that organizations require a broader and clearer perspective on enterprise-wide risk than ever before. Banking system always faces various types of risks such as bankruptcy risk, credit risk, liquidity risk, interest rate risk, exchange rate risk. The financial risks occurred, causing banks to fall into a state of a liquidity shortage, business operations facing difficulties, profits decreasing, making many banks faced with the risk of collapse, people will lose confidence in the banking system, leading to rushing money withdrawals, switching to other investment channels such as buying gold and foreign currencies, which quickly leads to scarce of capital (Batten and Vo, 2019).

According to Uremadu (2012), capital structure refers to the various financing options of the asset by a firm. A business concern can go for different levels of the mixture of equity, debt and other financial facilities with equity having the emphasis on maximizing the firm's value. Capital structure is the ratio of long-term debts of a firm to its equity financing. Capital structure affects the liquidity and liability of a firm. According to Miller (1977), if firms are more profitable, they prefer debt financing as compared to equity for the sake of profit. According to Myers and Majluf (1984), firms having high

profits, tend to attain low debt profile because when firms are more profitable, their first priority is to generate financing through retained earnings because they can maximize the value of the existing shareholders. If retained earnings are not sufficient, the firms can then go for debt and if further financing is required, they issue new equity.

Ismail and Ahmed (2023) defined financial risk as any risk associated with financing, including financial transactions and the likelihood that shareholders will lose money when they invest in a company with lots of debt. The risk may be split into systematic risk and unsystematic risk. The systematic risk or market risk is a risk that stems from the economic conditions and general market conditions, which are inescapable risks. However, the unsystematic risk is a portion of the risk which could be eliminated; this risk is sometimes referred to as a unique risk, residual risk or specific risk (Machdar, 2015). Likewise, Hsu and Jang (2008) argued that unsystematic risk is caused by firm-specific strategies, not factors outside management's control. Thus, investors use unsystematic risk to assess the firm's performance and equity costs. Knowing the factors that correlate to firm-specific (unsystematic) risk can help management make operational and financial decisions to avoid or mitigate a firm's total risk and can impact the reduction of a firm's equity costs. Credit risk lending is the core business of banks and the basis of earnings. In addition, it is a major factor influencing a bank's regulatory capital requirements. Credit risk is a necessary part of banking activity. Therefore, it should be managed carefully. When a bank gives money to a customer, there is an inherent risk that the money will not be repaid - credit risk. Credit risk is the probability of an undesirable situation in which a customer does not repay the loan amount. This is the primary control risk that should be managed. Similarly, Jahan *et al*. (2006) defined credit risk as the likelihood that some of a financial institution's assets, particularly loans, will depreciate and become worthless. According to Kamran *et al*. (2019), credit risk is the risk that one of the counterparties to a financial transaction will default. On the other hand, banks suffer operational risks from poor, outdated or inappropriate practices in their internal banking operations or from external events. Events involving operational risk are part of the operations of all businesses, not just banks. Banks assume that operational risk events will occur. In addition, the complexity of a bank's operations increases the potential for significant operational risks, which can adversely affect a bank's profitability. Therefore, banks' financial strategies often include provisions for operating losses (De Jongh *et al.,* 2013*)*. Operational risk can have a significant impact on financial stability if it leads

to the failure of financial institutions and loss of confidence in the financial system. Regulators and financial institutions, therefore, consider operational risk management when assessing and mitigating risks to financial stability.

Gizaw *et al.* (2015) examined the impact of credit risk on profitability performance of commercial banks. The study found that non-performing loan has a negative impact on profitability of commercial banks in Ethiopia. The study also found that loan loss provision and capital adequacy ratio have positive and significant impact on the profitability of commercial banks in in Ethiopia. Similarly, Dezfouli *et al.* (2014) revealed banking liquidity risk has a positive significant relation with the bank performance. Similarly, Otieno *et al.* (2016) concluded that liquidity risk has a positive and significant impact on performance of the commercial banks. Moreover, Musah (2018) examined that impact of capital structure on profitability of commercial banks in Ghana. The study revealed the debt equity ratio is positively associated with profitability of banks in Ghana. Similarly, Lestari (2021) found debt-equity ratio has a positive effect on return on assets but has a negative and significant effect on return on equity. Likewise, Dodoo *et al.* (2023) stated that debt to equity ratio has a positive association with return on asset and negative association with return on equity. Alarussi and Alhaderi (2018) investigated the factors affecting profitability in Malaysian listed companies. The study revealed a negative relationship between both debt equity ratio and leverage ratio and profitability. Likewise, Rahim *et al.* (2021) revealed that debt to assets ratio, bank size and bank efficiency all had significant impact on profitability. Bank size and bank efficiency have negative impact while debt to assets ratio has positive impact on profitability of Islamic bank. Similarly, Farooq *et al.* (2021) indicated that among internal factors, capital adequacy ratio, deposit ratio, leverage ratio, liquidity ratio, and bank size have significant effect on the return on asset.

In the context of Nepal, commercial banks are facing difficulties over the past years due to the relaxed credit standard, poor portfolio risks management and loan approvals without proper examination which increases the non-performing loan. Bagale (2023) assessed the effect of credit risk exposures on bank profitability. The study showed that cash reserve ratio, loan loss provision ratio and non-performing loan ratio have insignificant negative impact on return on equity in Nepalese commercial banks. Further, the study also concluded that liquidity ratio has significant positive impact on return on equity in Nepali commercial banks. Likewise, Poudel (2012) found that default rate, cost per loan asset, and capital adequacy ratio have an inverse

impact on banks' financial performance. Furthermore, Kafle (2023) revealed that capital adequacy ratio, loan to deposit ratio, cash reserve ratio, and bank size have a positive effect on banks' profitability. Similarly, non-performing loan ratio negatively affects banks' profitability. Likewise, Malla and Paudel (2023) showed that credit deposit ratio and cash reserve ratio have significant impact on lending than short term loan to total assets.

The above discussion shows that empirical evidences vary greatly across the studies concerning the effect of financial risk, capital structure and banking liquidity on bank profitability. 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 examine the impact of financial risk, capital structure and banking liquidity on the profitability of Nepalese commercial banks. Specifically, it examines the relationship of debt assets ratio, cash reserve ratio, credit to deposit, loan loss provision, non-performing loan and operational efficiency with return on asset 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.

2. Methodological aspects

The study is based on secondary data which were gathered from 16 commercial banks from 2015/16 to 2021/22, leading to a total of 112 observations. The study has used convenience sampling method to select the banks. The main sources of data include Banking and Financial statistics published by Nepal Rastra Bank, reports published by Ministry of Finance and the annual report of respective banks. This study is based on descriptive as well as causal comparative research designs. Table 1 shows the list of commercial banks selected for the study along with the study period and number of observations.

Table 1

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

S. N.	Name of the banks	Study period	Observations
1	Agricultural Development Bank Limited	2015/16 - 2021/22	7
2	Everest Bank Limited	2015/16 - 2021/22	7
3	Global IME Bank Limited	2015/16 - 2021/22	7
4	Himalayan Bank Limited	2015/16 - 2021/22	7
5	Kumari Bank Limited	2015/16 - 2021/22	7
6	Laxmi Bank Limited	2015/16 - 2021/22	7
7	Machhapuchchhre Bank International Limited	2015/16 - 2021/22	7
8	Nabil Bank Limited	2015/16 - 2021/22	7
9	Nepal Bank Limited	2015/16 - 2021/22	7
10	NIC Asia Bank Nepal Limited	2015/16 - 2021/22	7
11	NMB Bank Limited	2015/16 - 2021/22	7
12	Nepal SBI Bank Limited	2015/16 - 2021/22	7
13	Prime Commercial Bank Limited	2015/16 - 2021/22	7
14	Sanima Bank Limited	2015/16 - 2021/22	7
15	Siddhartha Bank Limited	2015/16 - 2021/22	7
16	Standard Chartered Bank Nepal Limited	2015/16 - 2021/22	7
Total number of observations			**112**

Thus, the study is based on 112 observations.

The model

The model used in this study assumes that the profitability of Nepalese commercial banks depends upon the debt assets ratio, cash reserve ratio, credit to deposit, loan loss provision, non-performing loan and operational efficiency. The dependent variables selected for the study are return on asset and return on equity. Similarly, the selected independent variables are debt assets ratio, cash reserve ratio, credit to deposit, loan loss provision, non-performing loan and operational efficiency. Therefore, the model takes the following form:

Bank's profitability = f (D/E, D/A, CRR, CDR, LLP, NPL and OE)

More specifically, the given model has been segmented into the following models:

$$ROA = \beta_0 + \beta_1 D/E + \beta_2 D/A + \beta_3 CRR + \beta_4 CDR + \beta_5 LLP + \beta_6 NPL + \beta_7 OE + e$$

$$ROE = \beta_0 + \beta_1 D/E + \beta_2 D/A + \beta_3 CRR + \beta_4 CDR + \beta_5 LLP + \beta_6 NPL + \beta_7 OE + e$$

Were,

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.

D/E = Debt to equity ratio as measured by the ratio of total debt to total equity, in times.

D/A = Debt to asset ratio as measured by the ratio of total debt to total asset, in percentage.

CRR = Cash reserve ratio as measured by the ratio of cash balance with NRB to total deposits, in percentage.

CDR = Credit to deposit ratio as measured by the ratio of total loan and advances to customers to total deposits, in times.

LLP = Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage.

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

OE = Operating efficiency as measured by the ratio of total operating expenses to total operating profit, in percentage.

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

Debt equity ratio

Debt equity ratio is measured by the ratio of total debt and total equity. Hasanudin (2023) investigated the effect of return on assets, current ratio and degree of leverage on debt-to-equity ratio mixed private banking sector listed on the Indonesia Stock Exchange. The study revealed that debt-to-equity ratio has a positive and significant impact on return on assets. Similarly, Mathur *et al*. (2023) depicted that debt-to-equity ratio has positively influenced the acquirer bank in the post-merger period. Furthermore, Sekarsari and Yuniningsih (2023) found that debt to equity ratios have a positive effect on return on assets. Dodoo *et al.* (2023) analyzed the effect of capital structure on company performance. The regression results showed that debt to equity ratio has a positive association with return on asset and negative with return on equity. Afandi and Haryono (2022) revealed that debt to equity ratio has a positive impact on return on assets. However, Ogunsola and Ogheneoparobo (2022) examined the relationship between capital structure, liquidity and financial

performance of listed deposit money banks in Nigeria and showed that debt equity ratio has a significant negative impact on financial performance. Based on it, this study develops the following hypothesis:

H_1: There is a positive relationship between debt-to-equity ratio and bank profitability.

Debt assets ratio

Bose *et al.* (2017) defined debt assets ratio as the percentage of total debt divided by total assets that illustrates the amount of funds contributed by the borrower and the assets of the company. Isayas (2022) examined the determinants of profitability in Ethiopia. The study found that debt assets ratio has a negative and statistically significant effect on the profitability of banks. Similarly, Karim *et al.* (2022) revealed that the debt assets ratios are negatively related to profitability and market return. Likewise, Surayya and Kadang (2022) implicated the effect of public ownership structure, capital structure, and credit risk on profitability in foreign exchange national private commercial banks. The results showed that the debt to assets ratio has a negative and statistically significant relationship with profitability of commercial banks. Likewise, AL-Shatnawi *et al.* (2021) found that there is a negative effect on the debt to assets ratio on the profitability of Jordanian commercial banks. Bunyaminu *et al*. (2021) explored the impact of financial leverage on profitability of recapitalized banks in Ghana. The study revealed that leverage exerts a significant negative effect on banks' profits regardless of the proxy of profitability. Based on it, this study develops the following hypothesis:

H_2: There is a negative relationship between debt assets ratio and bank profitability.

Cash reserve ratio

Cash reserve ratio (CRR) is the amount of cash that commercial banks have to keep in the form of reserves in the current account that they keep with the central bank. Akinsanmi *et al*. (2022) examined the impact of monetary policy on selected Nigerian banks' profitability. The findings of the study revealed that cash reserve ratio has a negative and insignificant impact on return on equity in the context of Nigerian banks. Likewise, Akinleye and Oluwadare (2022) showed that cash reserve ratio exerts a negative and significant effect on return on assets and return on equity. Mia *et al*. (2023) analyzed the impact of cash reserve ratio on banks profitability of conventional

commercial banks in Bangladesh. The study found that CRR has negative relation with return on assets and return on equity. Moreover, Oganda *et al.* (2018) concluded that cash reserve ratio has a negative relationship with bank's profitability in Kenya. However, Uremadu (2012) stated that cash reserve ratio and statutory liquidity rate are positively related with bank's profitability in Nigeria. Joseph and Adelegan (2023) showed that cash reserve ratio has a negative relationship with returns on equity. Based on it, this study develops the following hypothesis:

H_3: There is a negative relationship between cash reserve ratio and bank profitability.

Credit to deposit ratio

Credit to deposit ratio is the ratio of total credit provided by the banks out of the deposit collected. Astuti *et al.* (2023) analyzed the effect of capital adequacy ratio and loan to deposit ratio on return on assets. The study found that loan to deposit ratio has a significant positive effect on return on assets. Likewise, Michael and Enang (2022) assessed the impact of credit risk on the performance of banks with international authorization in Nigeria. The study revealed that credit to deposit ratio has a negative association with return on assets and positive with return on equity of Nigerian banks. Similarly, Umaru *et al*. (2022) revealed that credit to deposit ratio has a positive significant impact on financial performance of licensed microfinance banks in Nigeria. Moreover, Steven and Toni (2020) found that credit to deposit ratio has a positive relationship with profitability. Amalia (2021) determined the bank's performance in terms of the risk profile, income, and capital aspects of all banks in Indonesia. The study revealed that financing debt ratio (also known as loan to deposit ratio) has a significant positive effect on profitability (ROA) in banking in Indonesia. Based on it, this study develops the following hypothesis:

H_4: There is a positive relationship between credit deposit ratio and bank profitability.

Loan loss provision

Loan loss provision is the ratio of loan loss provision to total loan and advances to customers. Sang (2022) investigated the influence of credit risk on bank financial stability of Vietnamese commercial banks. The study revealed the negative relationship between loan loss provision and profitability of the bank. Similarly, Huong *et al.* (2021) investigated the liquidity risk and bank

performance in Southeast Asian countries. The study found that loan loss provision is negatively and significantly related to the return on assets of the commercial bank. Dao and Nguyen (2020) examined the determinants of capital adequacy ratio and banks' performance. The study showed that loan loss provision had negative and significant relationship with performance measured by return on assets. Similarly, Zheng *et al.* (2019) revealed the negative and significant relationship between the loan loss provision and return on equity of the commercial banks. Likewise, Ahmad *et al.* (2014) found that the loan loss provision has a negative and insignificant relationship with the profitability measured in terms of return on assets and return on equity. Based on it, this study develops the following hypothesis:

H_5: There is a negative relationship between loan loss provision and bank profitability.

Non-performing loans

Non-performing loans are measured as the percentage of non-performing loans to total loans. The level of a credit crunch is usually proxies by the ratio of bank's nonperforming loans (Alexandri and Santoso, 2015). Collaku and Aliu (2021) showed a significant negative relationship between non-performing loan and profitability as measured by return on assets. Likewise, Dewi and Badjra (2020) revealed that non-performing loans are negatively related to profitability. Similarly, Nwanna and Oguezue (2017) concluded that non-performing loans are negatively related to profitability of banks. However, Afriyie and Akotey (2012) found a positive relationship between non-performing loans and bank profitability. Moreover, Ramadhanti *et al.* (2019) determined the effect of capital adequacy, liquidity, and credit risk toward profitability. The study found a negative relationship between non-performing loans and bank profitability. Based on it, this study develops the following hypothesis:

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

Operational efficiency

Operating efficiency is measured by the ratio of operating expense to operating income. Anggraeni *et al*. (2022) analyzed the effect of liquidity, non-performing assets, sensitivity, and efficiency have an impact on the profitability and capital of Indonesian state-owned banks. The study revealed that operational efficiency ratio has a significant negative impact on

profitability. Similarly, Uddin (2022) examined the effect of non-performing loans on profitability with operating efficiency as an intervening variable. The results showed a direct effect of operating efficiency and has a negative and insignificant impact on profitability. Likewise, Hasmiana and Pintor (2022) indicated that operational efficiency partially has a significant effect on profitability. Farooq *et al.* (2021) found that return on equity is significantly affected by operational efficiency while assessing the impact of bank-specific and macro-economic factors on commercial banks profitability in Pakistan. Furthermore, Phan *et al.* (2020) estimated the factors affecting the profitability of listed commercial banks in Vietnam. The study revealed that operating efficiency have a negative impact on profitability. Similarly, Adam *et al.* (2018) concluded that operational efficiency negatively affected profitability. Based on it, this study develops the following hypothesis:

H_7: There is a negative relationship between operating efficiency 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 2015/16 to 2021/22.

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period of 2015/16 to 2021/22. 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 income to total equity, in percentage). The independent variables are D/E (to equity ratio as measured by the ratio of total debt to total equity, in times), D/A (Debt to asset ratio as measured by the ratio of total debt to total asset, in percentage), CRR (Cash reserve ratio as measured by the ratio of cash balance with NRB to total deposits, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loan and advances to customers to total deposits, in times), LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage) and OE (Operating efficiency as measured by the ratio of total operating expenses to total operating profit, in percentage).

Variables	Minimum	Maximum	Mean	S.D.
ROA	0.70	2.77	1.56	0.45
ROE	6.26	22.17	13.55	3.54
D/E	1.54	15.56	8.15	2.25
D/A	80.41	93.96	88.35	2.56
CRR	2.13	19.71	7.68	4.10
CDR	0.57	0.99	0.86	0.08
LLP	0.04	4.85	1.49	0.87
NPL	0.01	4.60	1.08	0.92
OE	21.28	81.62	44.54	9.43

Source: SPSS output

Correlation analysis

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

Table 3

Pearson's correlation coefficients matrix

This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2015/16 to 2021/22. 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 income to total equity, in percentage). The independent variables are D/E (to equity ratio as measured by the ratio of total debt to total equity, in times), D/A (Debt to asset ratio as measured by the ratio of total debt to total asset, in percentage), CRR (Cash reserve ratio as measured by the ratio of cash balance with NRB to total deposits, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loan and advances to customers to total deposits, in times), LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage) and OE (Operating efficiency as measured by the ratio of total operating expenses to total operating profit, in percentage).

Variables	ROA	ROE	D/E	D/A	CRR	CDR	LLP	NPL	OE
ROA	1								
ROE	0.630**	1							
D/E	-0.343**	0.336**	1						
D/A	-0.511**	0.299**	0.791**	1					
CRR	0.272**	0.185	0.038	-0.142	1				
CDR	-0.277**	-0.351**	-0.149	0.034	-0.489**	1			
LLP	0.039	-0.238*	-0.200*	-0.283**	-0.121	0.340**	1		
NPL	-0.149	-0.294**	-0.282**	-0.552**	-0.093	0.185	0.435**	1	
OE	-0.507**	-0.578**	0.080	-0.016	-0.127	-0.003	0.146	0.049	1

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

Table 3 shows that debt to equity ratio has a negative relationship with

return on assets. It means that increase in debt to equity leads to decrease in return on assets. Likewise, there is a negative relationship of debt to asset ratio with return on assets. It shows that higher the debt to asset ratio, lower would be the return on assets. Similarly, there is also a negative relationship between credit to deposit ratio and return on assets. It indicates that increase in credit to deposit ratio leads to decrease in return on assets. In addition, non-performing loan has a negative relationship with return on assets. It indicates that increase in non-performing loan leads to decrease in return on assets. Similarly, this study shows that there is a negative relationship between operating efficiency and return on assets. It means that higher the operating efficiency, lower would be the return on assets. In contrast, cash reserve ratio has a positive relationship with return on asset, indicating that higher the cash reserve ratio, higher would be return on asset. Moreover, there is a positive relationship between loan loss provision and return on asset. It implies that increase in loan loss provision leads to increase in return on asset.

On other hand, the result also shows that debt to equity ratio has a positive relationship with return on equity. It means that increase in debt-to-equity ratio leads to increase in return on equity. Likewise, there is a positive relationship between debt to asset ratio and return on equity. It means that increase in debt to asset ratio leads to increase in return on equity. Similarly, there is a positive relationship between cash reserve ratio and return on equity. It indicates that higher the cash reserve ratio, higher would be the return on equity. However, credit to deposit is negatively correlated to return on equity indicating increase in credit to deposit ratio leads to decrease in return on equity. Furthermore, there is a negative relationship between loan loss provision and return on equity. It indicates that increase in loan loss provision leads to decrease in return on equity. In addition, 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. Furthermore, there is a negative relationship between operating efficiency and return on equity. It means that higher the operating efficiency, lower will be 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 debt-to-equity ratio, debt to asset ratio, cash reserve ratio, credit to deposit ratio, loan loss provision, non-performing loan and operating efficiency on return on assets.

Table 4

Estimated regression results of debt-to-equity ratio, debt to asset ratio, cash reserve ratio, credit to deposit ratio, loan loss provision, non-performing loan and operating efficiency on return on assets

The results are based on panel data of 16 commercial banks with 112 observations for the period of 2015/16-2021/22 by using the linear regression model and the model is ROA = β_0 + β_1 D/E + β_2 D/A + β_3 CRR + β_4 CDR + β_5 LLP + β_6 NPL + β_7 OE + e where, the dependent variable is ROA (Return on asset as measured by the ratio of net profit to total asset, in percentage). The independent variables are D/E (to equity ratio as measured by the ratio of total debt to total equity, in times), D/A (Debt to asset ratio as measured by the ratio of total debt to total asset, in percentage), CRR (Cash reserve ratio as measured by the ratio of cash balance with NRB to total deposits, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loan and advances to customers to total deposits, in times), LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage) and OE (Operating efficiency as measured by the ratio of total operating expenses to total operating profit, in percentage).

Model	Intercept	Regression coefficients of							Adj. R_bar^2	SEE	F-value
		D/E	D/A	CRR	CDR	LLP	NPL	OE			
1	2.112 (14.046) **	-0.068 (3.835) **							0.110	0.422	14.706
2	9.430 (7.460) **		-0.089 (6.232) **						0.254	0.386	38.833
3	1.328 (15.265) **			0.030 (2.968) **					0.066	0.432	8.810
4	2.903 (6.495) **				-1.566 (3.027) **				0.068	0.432	9.160
5	1.526 (18.043) **					0.020 (0.411)			0.008	0.449	0.169
6	1.477 (22.770) **						-0.072 (1.584)		0.013	0.444	2.511
7	2.627 (14.817) **							-0.024 (6.176) **	0.251	0.387	38.138
8	11.154 (5.882) **	-0.032 (1.218)	-0.112 (4.781) **						0.257	0.385	20.243
9	9.763 (4.984) **	-0.017 (0.634)	-0.096 (4.030) **	0.021 (2.275) *					0.285	0.378	15.738
10	10.317 (5.324) **	-0.005 (0.191)	-0.089 (3.765) **	0.011 (1.049)	-1.180 (2.267) *				0.311	0.371	13.541
11	10.456 (5.168) **	-0.006 (0.229)	-0.091 (3.640) **	0.010 (1.041)	-1.130 (2.023) *	0.012 (0.251)			0.305	0.373	10.751
12	12.449 (4.956) **	-0.022 (0.740)	-0.115 (3.729) **	0.008 (0.795)	-1.001 (1.771)	0.004 (0.084)	-0.072 (1.330)		0.310	0.371	9.319
13	16.383 (8.425) **	-0.059 (2.578) **	-0.147 (6.216) **	0.005 (0.646)	-1.273 (2.980) **	0.054 (1.492)	-0.103 (2.517) **	-0.026 (8.978) **	0.608	0.280	25.557

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 debt to equity are negative with return on assets. It indicates that debt to equity has negative impact on return on assets. This finding is consistent with the findings of Ogunsola and Ogheneoparobo (2022). Likewise, the beta coefficients for debt to asset ratio are negative with return on assets. It implies that debt to asset ratio has a negative impact on return on assets. This finding is similar to the findings of Karim *et al.* (2022). Similarly, 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 consistent with the findings of Michael and Enang (2022). Moreover, the beta coefficients for operating efficiency are negative with return on assets. It indicates that operating efficiency has a negative impact on return on assets. This finding is similar to the findings of Uddin (2022). However, the beta coefficients for cash reserve ratio are positive with return on assets. It means that cash reserve ratio has a positive impact on return on assets. This finding is consistent with the findings of Uremadu (2012). Similarly, the beta coefficients for loan loss provision are positive with return on assets. It means that loan loss provision has a positive impact on return on assets. This finding is similar to the findings of Sang (2022).

Table 5 presents the estimated regression results of debt-to-equity ratio, debt to asset ratio, cash reserve ratio, credit to deposit ratio, loan loss provision, non-performing loan and operating efficiency on return on equity.

Table 5

Estimated regression results of debt-to-equity ratio, debt to asset ratio, cash reserve ratio, credit to deposit ratio, loan loss provision, non-performing loan and operating efficiency on return on equity

The results are based on panel data of 16 commercial banks with 112 observations for the period of 2014/15-2021/22 by using the linear regression model and the model is $ROE = \beta_0 + \beta_1 D/E + \beta_2 D/A + \beta_3 CRR + \beta_4 CDR + \beta_5 LLP + \beta_6 NPL + \beta_7 OE + e$ where, dependent variable is ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are D/E (to equity ratio as measured by the ratio of total debt to total equity, in times), D/A (Debt to asset ratio as measured by the ratio of total debt to total asset, in percentage), CRR (Cash reserve ratio as measured by the ratio of cash balance with NRB to total deposits, in percentage), CDR (Credit to deposit ratio as measured by the ratio of total loan and advances to customers to total deposits, in times), LLP (Loan loss provision as measured by the ratio of total loan loss provision to total loan, in percentage), NPL (Non-performing loan as measured by the ratio of non-performing loan to total loan, in percentage) and OE (Operating efficiency as measured by the ratio of total operating expenses to total operating profit, in percentage).

Model	Intercept	Regression coefficients of							Adj. R_bar^2	SEE	F-value
		D/E	D/A	CRR	CDR	LLP	NPL	OE			
1	9.243 (7.730) **	0.529 (3.740) **							0.105	3.353	13.984
2	-22.962 (2.064) *		0.413 (3.283) **						0.081	3.397	10.781
3	12.329 (17.5) **			0.159 (1.969)*					0.025	3.499	3.878
4	27.081 (7.847) **				-15.721 (3.933) **				0.115	3.333	15.470
5	15.003 (23.018) **					-0.972 (2.569) **			0.048	3.458	6.597
6	14.778 (29.714) **						-1.128 (3.225)**		0.078	3.403	10.401
7	23.233 (17.450) **							-0.217 (7.429) **	0.328	2.905	55.197
8	-0.641 (0.039)	0.419 (1.805)	0.122 (0.598)						0.099	3.363	7.131
9	-12.425 (0.725)	0.290 (1.229)	0.122 (0.598)	0.176 (2.203)*					0.130	3.305	6.539
10	-5.782 (0.349)	0.147 (0.635)	0.338 (1.671)	0.053 (0.062	-14.126 (3.172) **				0.198	3.175	7.831
11	-3.578 (0.207)	0.165 (0.701)	0.307 (1.436)	0.053 (0.612	-13.338 (2.792) **	-0.185 (0.466)			0.192	3.186	6.263
12	9.577 (0.444)	0.269 (1.050)	0.146 (0.549)	0.037 (0.422	-12.484 (2.575) **	-0.082 (0.2)	-0.474 (1.023)		0.192	3.186	5.395
13	44.693 (2.767) **	0.598 (3.150) **	0.134 (0.681)	0.081 (1.238)	-14.915 (4.204) **	-0.366 (1.214)	-0.752 (2.213)*	-0.235 (9.649) **	0.570	2.325	21.983

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 debt to equity are positive with return on equity. It indicates that debt to equity has positive impact on return on equity. This finding is inconsistent with the findings of Dodoo *et al.* (2023). Likewise, the beta coefficients for debt to asset ratio are positive with return on equity. It implies that debt to asset ratio has a positive impact on return on equity. This finding is similar to the findings of Isayas (2022). Similarly, the beta coefficients for cash reserve ratio are positive with return on equity. It indicates that cash reserve ratio has a positive impact on return on equity. This finding is consistent with the findings of Joseph and Adelegan (2023). Likewise, 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 similar to the findings of Zheng *et al.* (2019). Moreover, the beta coefficients for operating efficiency are negative with return on equity. It means that operating efficiency has a negative impact on return on equity. This finding is consistent with the findings of Adam *et*

al. (2018).

4. Summary and conclusion

A nation's banking industry has a significant impact on its economy. Banking institutions are companies that specialize in financial intermediation, which involves distributing excess liquidity among various economic participants. Compared to other financial intermediaries, commercial banks are better able to change the overall volume of loans. The economy and the nation are able to maintain their competitiveness and ability to absorb any negative shocks thanks to strong, profitable, competent, and well-managed banks.

Risk is inherent in every business, but organizations that embed the right risk management strategies into business planning and performance management are more likely to achieve their strategic and operational objectives. Taking risk is core to the Bank's business, and risks are an inevitable consequence of being in business. The bank's aim is therefore to achieve an appropriate balance between risk and return and minimize potential adverse effects on its performance. Dynamic business practices and demanding regulatory requirements mean that organizations require a broader and clearer perspective on enterprise-wide risk than ever before.

This study attempts to investigate the effect of financial risk, capital structure and banking liquidity on the profitability of Nepalese commercial banks. The study is based on secondary data of 16 commercial banks with 112 observations for the period from 2015/16 to 2021/22.

This study showed that debt to equity ratio, debt to asset ratio, credit to deposit ratio, non-performing loan and operating efficiency have a negative impact on return on asset. However, cash reserve ratio and loan loss provision have a positive impact on return on asset. On the other hand, debt to equity ratio, debt to asset ratio and cash reserve ratio has a positive impact on return on equity. However, credit to deposit, loan loss provision, non-performing loan and operating efficiency have a negative impact on return on equity. The study concluded that debt to asset ratio followed by operating efficiency is the most influencing factor that explains the changes in return on assets in the context of Nepalese commercial banks. Similarly, the study also concluded that operating efficiency is the most influencing factor that explains the changes in return on equity in the context of Nepalese commercial banks.

References

Adam, M., R. Safitri, and T. Wahyudi, 2018. Effect of company size, liquidity and operational efficiency on bank profitability with problem credit risk as a moderating variable at commercial banks that are listed on the Indonesia Stock Exchange. *Journal Perspektif Pembiayaan Dan Pembangunan Daerah* 6(3), 331-344.

Afandi, A., and S. Haryono, 2022. Pengaruh Islamicity Performance Index dan Debt Equity Ratio Terhadap Profitabilitas dengan Intellectual Capital sebagai Variabel Moderasi Periode 2016-2020. *MALIA: Journal of Islamic Banking and Finance* 6(1), 1-14.

Afriyie, H. O., and J. O. Akotey, 2012. Credit risk management and profitability of selected rural banks in Ghana. *Ghana: Catholic University College of Ghana* 7(4), 176-181.

Ahmad, F., S. H. Tahir, and B. Aziz, 2014. Impact of loan loss provision on bank profitability in Pakistan. *TIJ's Research Journal of Social Science and Management* 3(12), 34-41.

Akinleye, G. T., and O. E. Oluwadare, 2022. Cash reserve requirement and banks 'profitability: Evidence from deposit money banks in Nigeria. *Academy of Accounting and Financial Studies Journal* 26(1), 1-13.

Akinsanmi, F. J. S., R. Oladele, O. Alabi, and R. O. Adeboboye, 2022. Do Monetary Policies really influence Performance of Banks in Nigeria? *KIU Interdisciplinary Journal of Humanities and Social Sciences* 3(1), 131-150.

Alarussi, A. S., and S. M. Alhaderi, 2018. Factors affecting profitability in Malaysia. *Journal of Economic Studies* 45(3), 442-458.

Alexandri, M. B., and T. I. Santoso, 2015. Non-performing loan: Impact of internal and external factor (Evidence in Indonesia). *International Journal of Humanities and Social Science Invention* 4(1), 87-91.

AL-Shatnawi, H. M., N. M. Hamawandy, and R. Jafar, 2021. The role of the size and growth rate of the bank in determining the effect of financial leverage on the profitability of Jordanian commercial banks. *Journal of Contemporary Issues in Business and Government* 27(1), 1962-1978.

Amalia, S., 2021. The impact of financial ratio indicators on banking profitability in Indonesia. *Turkish Journal of Computer and Mathematics Education* 12(8), 580-588.

Anggraeni, A., B. Basuki, and R. Setiawan, 2022. Factors influencing on bank capital and profitability: Evidence of government banks in Indonesia. *The Journal of*

Asian Finance, Economics and Business 9(2), 185-191.

Astuti, E. P., R. Hermawati, and R. Handayani, 2023. Pengaruh capital adequacy ratio dan loan to deposit ratio terhadap return on asset pada pt bank Mandiri. *Scientific Journal of Reflection: Economic, Accounting, Management and Business* 6(1), 143-150.

Bagale, S., 2023. Credit risk management and profitability of commercial banks in Nepal. *International Journal of Finance and Commerce* 5(1), 60-67.

Batten, J., and X. V. Vo., 2019. Determinants of bank profitability: An evidence from Vietnam. *Emerging Markets Finance and Trade* 55(6), 1417-1428.

Bose, S., A. Saha, H. Z. Khan, and S. Islam, 2017. Non-financial disclosure and market-based firm performance: The initiation of financial inclusion. *Journal of Contemporary Accounting and Economics* 13(3), 263-281.

Bunyaminu, A., I. N. Yakubu, and S. Bashiru, 2021. The effect of financial leverage on profitability: An empirical analysis of recapitalized banks in Ghana. *International Journal of Accounting and Finance Review* 7(1), 93-102.

Collaku, B., and M. Aliu, 2021. Impact of non-performing loans on bank's profitability: empirical evidence from commercial banks in Kosovo. *Journal of Accounting, Finance and Auditing Studies* 7(3), 226-242.

Dao, B. T. T., and K. A. Nguyen, 2020. Bank capital adequacy ratio and bank performance in Vietnam: A simultaneous equations framework. *The Journal of Asian Finance, Economics and Business* 7(6), 39-46.

De Jongh, E., D. De Jongh, R. De Jongh, and G. Van Vuuren, 2013. A review of operational risk in banks and its role in the financial crisis. *South African Journal of Economic and Management Sciences* 16(4), 364-382.

Dewi, N. K. C., and I. B. Badjra, 2020. The effect of NPL, LDR and operational cost of operational income on ROA. *American Journal of Humanities and Social Sciences Research* 4(7), 171-178.

Dezfouli, M. H. K., A. Hasanzadeh, and M. Shahchera, 2014. Inspecting the effectiveness of liquidity risk on banks profitability. *Kuwait Chapter of Arabian journal of Business and Management Review* 33(2), 1-17.

Dodoo, R. N. A., M. Kumi, and T. Mangudhla, 2023. The effect of capital structure on firm performance: empirical evidence from emerging economy. *Journal of Management* 5(1), 83-99.

Elkmash, M. R. M., 2023. The impact of financial inclusion on bank profitability and economic growth: Evidence from Egypt. *Scientific Journal of Financial and Administrative Studies and Research* 15(1), 1-23.

Farooq, M., S. Khan, A. Siddiqui, M. Khan, and M. Khan, 2021. Determinants of profitability: A case of commercial banks in Pakistan. *Humanities and Social Sciences Reviews* 9(2), 1-13.

Gizaw, M., M. Kebede, and S. Selvaraj, 2015. The impact of credit risk on profitability performance of commercial banks in Ethiopia. *African Journal of Business Management* 9(2), 59-76.

Hasanudin, H., 2023. Effect of return on assets, current ratio and degree of leverage on debt-to-equity ratio mixed private banking sector listed on the Indonesia Stock Exchange 2016-2020. *International Journal of Artificial Intelligence Research* 6(1), 1-8.

Hasmiana, M., and S. Pintor, 2022. The effect of financial risk, capital structure, banking liquidity on profitability: Operational efficiency as intervening variables in Persero bank and private commercial banks. *International Journal of Arts and Social Science* 5(1), 581-579.

Hsu, L. T., and S. Jang, 2008. The determinant of the hospitality industry's unsystematic risk: A comparison between hotel and restaurant firms. *International Journal of Hospitality and Tourism Administration* 9(2), 105-127.

Huong, T. T. X., T. T. T. Nga, and T. T. K. Oanh, 2021. Liquidity risk and bank performance in Southeast Asian countries: A dynamic panel approach. *Quantitative Finance and Economics* 5(1), 111-133.

Isayas, Y. N., 2022. Determinants of banks' profitability: Empirical evidence from banks in Ethiopia. *Cogent Economics and Finance* 10(1), 1-15.

Ismail, S., and E. Ahmed, 2023. The impact of liquidity risk, credit risk, and operational risk on financial stability in conventional banks in Jordan. *Uncertain Supply Chain Management* 11(2), 433-442.

Jahan, N., S. F. Iftikhar, C. S. Ahmed, and T. Hussain, 2022. Risk management and its impact on banking sector performance: Evidence from Pakistan. *Competitive Social Science Research Journal* 3(2), 354-379.

Joseph, I. E., and O. Adelegan, 2023. Liquidity Management and financial performance of deposit money banks in Nigeria. *Journal of Academic Research in Economics* 10(2), 1-24.

Kafle, R., 2023. Impact of credit risk management on profitability of Nepalese commercial banks. *International Journal of Finance and Commerce* 5(1), 32-39.

Kamran, H. W., A. Omran, and S. B. bin Mohamed Arshad, 2019. Liquidity risk management in banking sector under the shadow of systematic risk and

economic dynamics in Pakistan. *Pakistan Journal of Humanities and Social Sciences* 7(2), 167-183.

Karim, S., M. U. Akhtar, R. Tashfeen, M. Raza Rabbani, A. A. A. Rahman, and A. AlAbbas, 2022. Sustainable banking regulations pre and during coronavirus outbreak: The moderating role of financial stability. *Economic Research-Ekonomska Istraživanja* 35(1), 3360-3377.

Lestari, H. S., 2021. Financial leverage and financial performance of conventional banks in Indonesia. *Journal of Hunan University Natural Sciences* 48(2), 24-35.

Machdar, N. M., 2015. The effect of capital structure, systematic risk, and unsystematic risk on stock return. *Business and Entrepreneurial Review* 14(2), 149-160.

Malla, M., and S. Paudel, 2023. Liquidity regulation and bank lending in Nepalese commercial bank. *International Journal of Finance and Commerce* 5(1), 40-46.

Mathur, R., M. Sharma, P. Baheti, and A. Gupta, 2023. Measuring the operating performance of the acquirer bank in the pre and post period: merger between Ing Vysya bank and Kotak Mahindra bank. *Central European Management Journal* 33(1), 881-902.

Mia, M. F., M. A. Nodi, A. Mia, and S. Alam, 2023. Impact of cash reserve ratio on banks profitability: A study on conventional commercial banks in Bangladesh. *Journal of Asian Business Strategy* 13(1), 24-32.

Michael, E. I., and E. R. Enang, 2022. Credit risk and performance of banks in Nigeria. I*nternational Journal of Research in Finance and Management* 5(1), 16-24.

Mudanya, L. E., and W. Muturi, 2018. Effects of financial risk on profitability of commercial banks listed in the Nairobi Securities Exchange. *International Journal of Social Sciences Management and Entrepreneurship* 1(1), 1-14.

Musah, A., 2018. The impact of capital structure on profitability of commercial banks in Ghana. *Asian Journal of Economic Modelling* 6(1), 21-36.

Myers, S. C., and N. S. Majluf, 1984. Corporate financing and investment decisions when firms have information those investors do not have. *Journal of Financial Economics* 13(5), 187- 221.

Nwanna, I. O., and F. C. Oguezue, 2017. Effect of credit management on profitability of deposit money banks in Nigeria. *International Journal of Banking and Finance Research* 3(2), 137-160.

Oganda, A. J., V. A. Mogwambo, and S. Otieno, 2018. Effect of cash reserves on performance of commercial banks in Kenya: A comparative study between

national bank and equity bank Kenya limited. *International Journal of Academic Research in Business and Social Sciences* 8(9), 685-704.

Ogunsola, A., and A. D. Ogheneoparobo, 2022. Capital structure, asset liquidity and financial performance of listed deposit money banks in Nigeria. *African Journal of Accounting and Financial Research* 5(2), 16-29.

Otieno, S., M. Nyagol, and A. Onditi, 2016. Empirical analysis on relationship between liquidity risk management and financial performance of microfinance banks in Kenya. *Research Journal of Finance and Accounting* 7(6), 115-142.

Phan, H. T., T. N. Hoang, L. V. Dinh, and D. N. Hoang, 2020. The determinants of listed commercial banks' profitability in Vietnam. *The Journal of Asian Finance, Economics and Business* 7(11), 219-229.

Poudel, R. P. S., 2012. The impact of credit risk management on financial performance of commercial banks in Nepal. *International Journal of Arts and Commerce* 1(5), 9-15.

Rahim, A., M. M. Khan, W. Iftikhar, S. Ashraf, and S. Mehmood, 2021. An implication of signaling theory to examine impacts of financial leverage on firm performance: A study of Islamic Banks in Asian region. *Psychological Education* 58(2), 6700-6721.

Ramadhanti, C., M. Marlina, and S. Hidayati, 2019. The effect capital adequacy, liquidity and credit risk on profitability of commercial banks. *Journal of Economics, Business, and Government Challenges* 2(1), 71-78.

Sang, A. N. Q., 2022. The relationship between credit risk and bank financial stability: The Mediating role of bank profitability. *Journal of Hunan University Natural Sciences* 49(1), 263-271.

Sekarsari, I., and Y. Yuniningsih, 2023. Analisis kinerja bank umum konvensioanal yang terdaftar di bursa efek Indonesia. *Oikos: Jurnal Ekonomi dan Pendidikan Ekonomi* 7(1), 85-95.

Steven, S., and N. Toni, 2020. The effect of bank capacity and loan to deposit ratio on profitability and credit risk. *International Journal of Multicultural and Multireligious Understanding* 7(11), 1-9.

Surayya, S., and J. Kadang, 2022. Effect of public ownership structure, capital structure, and credit risk on profitability in foreign exchange national private commercial banks. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences* 5(1), 1-11.

Tafri, F. H., Z. Hamid, A. K. M. Meera, and M. A. Omar, 2009. The impact of financial risks on profitability of Malaysian commercial banks: 1996-2005. *International*

Journal of Social, Human Science and Engineering 3(6), 268-282.

Uddin, M. K., 2022. Effect of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of commercial banks in Bangladesh. *European Journal of Business and Management Research* 7(3), 289-295.

Umaru, D., Y. Abubakar, and O. Oluwafemi, 2022. Credit risk management and financial performance of microfinance banks in Nigeria. *International Journal of Advances in Engineering and Management* 4(2), 1509-1514.

Uremadu, S. O., 2012. Bank capital structure, liquidity and profitability evidence from the Nigerian banking system. *International Journal of Academic Research in Accounting, Finance and Management Sciences* 2(1), 98-113.

Zheng, C., S. M. Perhiar, N. G. Gilal, and F. G. Gilal, 2019. Loan loss provision and risk-taking behavior of commercial banks in Pakistan: A dynamic GMM approach. *Sustainability* 11(19), 220-233.