Effect of working capital management and credit management policy on financial performance of commercial bank in Nepal

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Abstract

This study analyzes the impact of working capital management and credit management policy on the financial performance of Nepalese commercial banks. The study uses data from 16 commercial banks, collected from their annual reports, over the period from 2014/15 to 2021/22. The dependent variables considered are return on asset and return on equity, while the independent variables are working capital, loan to deposit ratio, capital adequacy ratio, non-performing loan, cash asset ratio, operating cash flow to total asset, and rate of bank's ability to return deposits. The study finds that working capital, cash asset ratio, operating cash flow to total assets, and rate of bank's ability to return deposits have a positive impact on bank return on assets and return on equity. On the other hand, loan to deposit ratio, capital adequacy ratio, and non-performing loan have a negative impact on both return on assets and return on equity. The study provides insights for the management of commercial banks to enhance their financial performance.

Key words: Return on asset, return on equity, working capital, loan to deposit ratio, capital adequacy ratio, non-performing loan, cash asset ratio, operating cash flow to total assets and rate of bank's ability to return deposits.

I. Introduction

The success of a country's economy primarily depends upon on its banking sector performance. Banks serve the vital intermediary role in a market-oriented economy and have been seen as the key to investment and growth. A strong and profitable banking system promotes broader financial stability and increases the economy's resilience to adverse macroeconomic shocks (Tafri*et al.*, 2009).Fase and Abma (2003) stated that the expansion of the financial system can have a positive impact on the economic growth of a country. Similarly, commercial banks play an important part for economic development of a country as they provide capital for the development of industry,trade and business by investing the savings collected as deposits from public. It also offers numerous services to its customers in view of vacillating their economic and social life so that integrated and speedy development of a country is only possible when competitive, reliable banking services are reached and carried to every corner of the country. Banks are viable financial institutions which mobilize financial resources through their intermediation role for productive investment, trade and other economic activities (Eriki and Osifo, 2015). Furthermore, there is a strong consensus that a stable banking system is necessary for sustainable economic growth and that banks thus play a crucial and important role in economic development (Menicucci and Paolucci 2016). Yakubu and Affoi (2014) indicated that a substantial link exists between the role of commercial bank and economic growth and development. Mara and Nicoleta (2019) used ROE to evaluate financial performance

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of studied companies. Mbu-Ogar*et al.* (2017) showed that the profit is a standard indicator for evaluating a bank's financial performance, since profit maximization is one of the most important objectives for any business venture and determines the short-term profitability. Smith (1980) argued in a pioneering study that working capital management is essential because it affects the profitability and risk of the company.

Similarly, Mburu *et al.* (2020) stated that working capital is vital to the continued operations of companies involved in various activities. Working capital management has to do with managing all segments of current assets such as cash and equivalent assets and current liabilities such as short-term debts (Yahaya and Bala, 2015). When it is no longer circulated, it ceases to exist. Likewise, most of the financial decisions of a bank are concerned with current assets and current liabilities. It plays a significant role to fulfill the requirement of working capital of any other type of business enterprises. Bhattacharya (2001), mentioned that working capital is the cash available for day-to-day functions of a business. Furthermore, working capital decisions have an influence on the firm's risk, return, and market value (Horne and Wachowicz, 2008). Working capital management enhances the development of banking sectors by adequate allotment of working capital in the economy (Ghosh, 2015). Thus, working capital management is a critical component of financial management. It plays a crucial role in success and failure of business companies irrespective to their nature. It is primarily focused on the conduct of liabilities' liquidity components and current short-term assets (Niresh, 2012). It is impossible for any business to run smoothly without appropriate control for it.

On other hand, credit management policy contains solidity and safety of purse invested for achieving a bank's profitability. It is a formal written document that details how the decision whether or not to grant credit is taken and how outstanding receivables are collected. Myers and Brealey (2003) described credit management as the method and strategy adopted by a firm to ensure that they maintain an optimal level of credit and its effective management. It is an aspect of financial management involving credit analysis, credit rating, credit classification and credit reporting. A key requirement for effective credit management is the ability to intelligently and efficiently manage customer credit lines. In order to minimize exposure to bad debt, over reserving and bankruptcies, companies must have greater insight into customer financial strength, credit score history and changing payment patterns (Kagoyire and Shukla, 2016). For commercial banks to minimize loan losses, it's essential they develop an effective credit risk management system (Barton *et al.,* 2002). Credit risk management is very important to banks as it an integral part of the loan process. It maximizes bank risk, adjusted risk rate of return by maintaining credit exposure with view to shielding the bank from the adverse effect of credit risk (Kargi, 2011). Berger and DeYoung (1997) pointed out that the absence of effective credit risk management would lead to the incidence of banking turmoil and even the financial crisis.

Abdulnafea*et al.* (2022) investigated the impact of working capital management and credit management policy on the financial performance of Jordanian banks. The study found a statistically significant relationship between working capital management and financial performance. Ibrahim and Isaika (2021) examined the effect of working capital management on the financial performance of non- financial companies quoted on the Nigerian stock exchange. The study revealed that working capital management have a significant effect on financial performance.Adiyanto*et al.* (2020) revealed that the size of working capital is influenced by the operating cash flow available in the firms which indicates that the firms that are able to generate operating cash flow tend to have higher cash and working capital. Uremadu (2017) analyzed on working capital management and financial performance of manufacturing sectors in Nigeria where return on assets was used as a performance measure. The study concluded that manufacturing firms in Nigeria should follow conservative working capital management policy.

Siddique *et al.* (2021) examined the effect of credit risk management and bank-specific factors on South Asian commercial banks' financial performance. The study found that non-performing loan have significantly negatively related to financial performance while capital adequacy is significantly positively related the financial performance of the Asian commercial banks.Al-Husainy and Jadah (2021) examined the impact of liquidity and credit risks on the profitability of Iraqi commercial banks. The study found that liquidity risk has a significant positive relationship with bank profitability. Gatuhu (2013) studied the effects of shareholder wealth on providing funding to clients. The study found that using commercial credit as a tool for assessing financial patterns actually hampers sales growth. Ezejiofor*et al.* (2015) examined the association between credit management policy and the growth of profitability in Nigerian manufacturing companies. The study revealed that there is a positive link between the cash transfers cycle and collections and manufacturing company growth, as well as a negative relationship between payment periods. According to the findings, non-compliance with credit management firms may stymie their growth and sustainability. Moreover, credit management contributes to the performance of small intermediate institutions.

Furthermore, Fidelis and Umoffong (2020) examined the influence of credit management on manufacturing company profitability. The study found that liquidity management and credit policy have a large negative association with return on assets, whereas the debtor's rotation rate has a strong positive relationship with active return. At the same time, credit risk has a significant negative relationship with a bank's profitability. Munangi and Bongani (2020) analyzed the impact of credit risk on the financial performance of eighteen south african banks. The study found that there is a negative correlation of credit risk with financial performance. The higher the non-performing loan ratio, the lower the bank's profitability, and also, the growth had a positive impact on financial performance.Jibrin *et al.* (2013) examined the components of credit policy, such as credit conditions, recovery attempts, credit period, and credit standards. The study concluded that the way loan policies are developed has an impact on the profitability.

Siddique *et al.* (2020) argued that when high NPLs is spread, there is a chance that banks or financial declared bankrupt. Adebayo *et al.* (2011) conducted their study on Ghana region of Brong-Ahafo on the emerging problem of credit risk management and investigated the nature of the relationship with the profitability of the rural banks. The study concluded that there is a significant positive interrelation between NPLs and bank financial performance as the loan losses increase the performance and profitability, showing an increasing trend.Effective management of credit risk or non- performance exposure in the banking sectors increases profitability. According to Abuzayed (2012), cash capital management assessed by receivables, the currency conversion cycle, and credit account maintenance have a significant beneficial impact on organizational performance as evaluated by both return on assets and return on investment. Highly profitable firms are able to provide more credit facilities to customers thereby, expected to have a greater working capital investment (Moussa, 2019). Firms with large growth opportunities are required to provide large working capital in order to take advantage of these business opportunities (Singh *et al.,* 2017). Masood and Ashraf (2012) stated that the credit risk high ratio of NPLs is the main reason for most of the financial crisis and concluded that when there is a large amount of loan defaulter, it adversely affects the profitability of the banking sector.

Chimkono*et al.* (2016) examined the nature of relationship between credit riskand financial performance of banks. The study found that there is a negative relationship between credit risk and banks' financial performance. Ugoani (2015) has examined the relationship of poor credit risk management and bank failure in Nigeria using survey research design. The study revealed that weak corporate governance accelerates bank failures and the credit

risk management functions is to the greatest extent the most diverse and complex activity in the banking business and concluded that poor credit risk management influences bank failures. Gadzo*et al.* (2019) assessed the effect of credit and operational risk on the financial performance of universal banks in the context of the structural equation model (SEM). The study showed that credit risk influences financial performance negatively and found that operational risk influences the financial performance of the universal banks in Ghana negatively. Furthermore, the study indicated that bank specific variables measured by (asset quality, bank leverage, cost to income ratio and liquidity) significantly influence credit risk, operational risk as well as the financial performance of the universal banks positively.Kurawa and Garba (2014) assessed the effect of credit risk management (CRM) on the profitability of Nigerian banks. The study concluded that credit risk management components have a significant positive effect on the profitability of Nigerian banks. Similarly, Abiola and Olausi (2014) analyzed the impact of credit risk management on the commercial bank's performance in Nigeria. The study revealed that credit risk management has a significant impact on the performance of the banks in Nigeria. Furthermore, the results concluded that the sampled have poor credit risk management practices; hence the high levels of the non-performing loans in their loans portfolios.

In context of Nepal, Chhetri (2021)investigated the effect of credit risk on the financial performance of commercial banks in Nepal. The study revealed that non-performing loan (NPLR) has negative and statistically significant impact on financial performance (ROA). Capital adequacy ratio (CAR) and bank size (BS) have negative and statistically no significant impact on financial performance (ROA). Credit to deposit (CDR) has positive but no significant relationship with the financial performance (ROA). The study concluded that the management quality ratio (MQR) has positive and significant relationship with the financial performance (ROA) of the commercial banks in Nepal. Pantha (2019) investigated impact of credit risk management on bank performance and suggested that default rate and cost per loan asset are the significant variables explaining the banks' performance. However, capital adequacy ratio is insignificant for the banks' performance.Gurung and Gurung (2022) observed the factors determining profitability of Nepalese commercial banks the study found that loan to deposit ratio and GDP have a positive and significant impact on return on assets. Further, the study also showed non-performing loan and capital adequacy ratio have a negative and significant impact on return on equity. However, the study revealed bank size, loan loss provision and inflation have a positive and significant impact on return on equity.

Shrestha (2020) analyzed that credit to deposit ratio. The study found that non-performing loan have a positive and significant impact on financial performance of Nepalese commercial banks as measured by return on assets. However, Bhatt and Verghese (2018) concluded that credit to deposit ratio has a negative and significant relationship with return on assets of Nepalese commercial banks. Pradhan and Shah (2019) focused on credit risk assessment practices in commercial banks on the basis of their internal efficiency, assessment of assets and borrower and discovered that credit risk management practices and credit risk mitigation measures have a positive relationship with loan repayment, while obstacles faced by borrowers have no significant relationship with loan repayment.Shrestha (2018) investigated the relationship between liquidity management and profitability and its impact on profitability of commercial banks in Nepal and the liquidity. The study revealed that liquidity does not have its significant impact on profitability in Nepalese commercial banks.

Bhattarai (2017) revealed that the NPL, CAR, LIQ have significant and negatively associated with ROE. Similarly, size has a significant and positive association with ROE and concluded that among study variables NPL, CAR, LIQ, and SIZE have a major role to determine profitability. Likewise, Gyawali (2018) found a negative effect of the non-

performing loans on return on assets in the context of Nepali public banks. Further, the study also concluded that capital adequacy ratio, loan to deposit ratio and loan loss provision have a positive relationship with the profitability of banks in Nepal. However, Karki (2004) revealed that there is a positive relationship between capital adequacy ratio and profitability. Marahatta*et al.* (2016) examined the determinants of Nepalese commercial banks performance and revealed that bank size and liquidity have a positive relationship with return on assets.

The above discussion shows that empirical evidences vary greatly across the studies on the effect of working capital management and credit management policy on financial performance of 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 effect of working capital management and credit management policy on financial performance of Nepalese commercial banks. Specifically, it examines the relationship of working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total asset and rate of bank's ability to return deposits 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.

II. Research Methodology

The study is based on the secondary data which were gathered from 16 commercial banks for the period from 2014/15 to 2021/22, leading to a total of 128 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
Public Banks			
1	Nepal Bank Limited	2014/15 - 2021/22	8
2	Rastriya Banijya Bank Limited	2014/15 - 2021/22	8
Joint Venture Banks			
3	Everest Bank Limited	2014/15 - 2021/22	8
4	Himalayan Bank Limited	2014/15 - 2021/22	8
5	Nabil Bank Limited	2014/15 - 2021/22	8
6	NMB Bank Limited	2014/15 - 2021/22	8
Private Banks			
7	Citizen Bank International Limited	2014/15 - 2021/22	8
8	Global IME Bank Limited	2014/15 - 2021/22	8
9	Kumari Bank Limited	2014/15 - 2021/22	8
10	Mega Bank Nepal Limited	2014/15 - 2021/22	8
11	Nepal Investment Bank Limited	2014/15 - 2021/22	8
12	NIC Asia Bank Limited	2014/15 - 2021/22	8
13	Prabhu Bank Limited	2014/15 - 2021/22	8
14	Prime Commercial Bank Limited	2014/15 - 2021/22	8
15	Sanima Bank Limited	2014/15 - 2021/22	8
16	Siddhartha Bank Limited	2014/15 - 2021/22	8
	Total number of observations		**128**

The study employed stratified sampling method. The main sources of data include 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.

The model

The model used in this study assumes that the bank's financial performance depends upon working capital management and credit management policy. The dependent variables selected for the study are return on asset and return on equity. Similarly, the selected independent variables are working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total assets and rate of bank's ability to return deposits. Therefore, the model takes the following form:

Financial performance = f (WC, LDR, CAR, NPL, CR, OTA and RBARD)

More specifically,

ROA= β_0 + β_1 WC + β_2 LDR+ β_3 CAR+ β_4 NPL + β_5 CR + β_6 OTA+ β_7 RBARD + e_{it}

ROE= β_0 + β_1 WC + β_2 LDR+ β_3 CAR+ β_4 NPL + β_5 CR+ β_6 OTA+ β_7 RBARD+ e_{it}

Where,

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

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

WC= Working capital as measured by current assets deducted by current liabilities, in NRs billion.

LDR= Loan to deposit ratio as measured by the total loan to total deposit, in percentage.

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

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

CR = Cash asset ratio as measured by cash and cash equivalent to current liabilities, in percentage.

OTA= Operating cash flow to total assets as measured by operating cash flow to total assets, in percentage.

RBARD= Rate of bank's ability to return deposits as measured by total equity to total deposit, in percentage.

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

Working capital

Yashim *et al.* (2020) established that working capital management has a significant and positive effect on Return on Asset (ROA) of the Nigerian Deposit Money Banks. Lartey and Boadi (2018) revealed that there is a positive and statistically significant relationship between working capital and Return on Equity of the listed banks. Kehinde (2018) revealed that there is no significant relationship between working capital and Return on Asset. Uremadu (2017) carried out a study on working capital management and financial performance of manufacturing sectors in Nigeria and found that there is positive impact of working capital on financial performance measured by return on assets. Danuletiu (2010)

concluded that profitability has an inverse relationship with working capital management components. Based on it, this study develops the following hypothesis:

H_1: *There is a positive relationship between working capital and bank's financial performance.*

Loan to deposit ratio

Suroso (2022) identified that loan to deposit ratio has a negative effect on ROA and ROE. However, Steven and Toni (2020) found that credit to deposit ratio has a positive relationship with ROA and ROE. Similarly, Vellanita *et al.* (2019) revealed a negative relationship between loan to deposit ratio and return on equity. Likewise, Golubeva *et al.* (2019) showed that loan to deposit ratio has a negative relationship with return on equity.Mohanty and Krishnankutty (2018) showed that return on asset has a negative and significant relationship with loan to deposit ratio. Mehta and Bhavani (2017) concluded that loan to deposit ratio is negatively related to return on assets and return on equity. Based on it, this study develops the following hypothesis:

H_2: *There is a negative relationship between loan to deposit ratio and bank's financial performance.*

Capital adequacy ratio

Kumar *et al.* (2020) revealed that capital adequacy ratio is positively related to return on assets.Farkasdi *et al.* (2021) determined the determinants of profitability in commercial banks in Germany and showed a positive relationship between capital adequacy ratio and profitability measured by return on equity. Similarly, Nahar *et al.* (2020) identified a positive relationship between capital adequacy ratio and financial performance. Handayani *et al.* (2019) analyzed the determinants of Islamic commercial bank profitability in Indonesia and revealed that capital adequacy ratio is positively related to return on assets. Ariwidanta and Wiksuana (2018) determined the relationship between credit and liquidity risk to profitability through the capital adequacy ratio as a mediating variable and concluded that capital adequacy ratio is positively related to return on assets.However, Sayani *et al.* (2017) found that there is a negative relationship between capital adequacy ratio and financial performance. Based on it, this study develops the following hypothesis:

H_3: *There is a positive relationship between capital adequacy ratio and bank's financial performance.*

Non-performing loan

Anggriani and Muniarty (2020) stressed that banks should lower the level of non-performing loan to increase return on assets suggesting a negative relationship between non-performing loan and financial performance. Çollaku and Aliu (2021) showed a significant negative relationship between non-performing loan and profitability as measured by return on assets. Likewise, Brastama and Yadnya (2020) concluded that non-performing loan is negatively related to financial performance. Similarly, Dewi and Badjra (2020) revealed that non-performing loan is negatively related to profitability. Ramadhanti *et al.* (2019) determined the effect of capital adequacy, liquidity, and credit risk toward profitability and found that there is a negative relationship between non-performing loan and bank profitability.Based on it, this study develops the following hypothesis:

H_4: *There is a negative relationship between capital adequacy ratio and bank's financial performance.*

Cash asset ratio

Shrestha (2018) revealed that cash asset ratio does not have its significant impact on return on assets in Nepalese commercial banks. Alshatti (2015) investigated the effect of the liquidity management on profitability in the Jordanian commercial and showed that there is a positive effect of the increase in the quick ratio and the investment ratio of the available funds on the profitability, while there is a negative effect of the capital ratio and the cash assets ratio on ROA and ROE of the Jordanian commercial banks. Malik *et al.* (2016) revealed that there is a statistically significant relationship of cash to asset with return on assets and return on equity. Abdullah and Jahan (2014) concluded that there is no significant relationship between cash asset ratio and profitability (ROA and ROE). Bardia (2004) concluded that there is a positive relationship between cash asset ratio and profitability. Sur *et al.* (2001) revealed that there is a very significant positive association between cash and cash equivalent and financial performance. Based on it, this study develops the following hypothesis:

H$_5$: There is a positive relationship between cash asset ratio and bank's financial performance.

Operating cash flow to total assets

Ghodrati and Abyak (2014) investigated the relationship between operational cash flow and the returns to stockholders and showed that there is a significant relationship between the operating cash flows profitability and the returns of all stakeholders. Frank and James (2014) found that operating and financing cash flow have significant positive relationship with firm performance while investing cash flow and corporate performance have significant negative relationship. Mauchi*et al.* (2011) found out that there is a positive relationship between the level of operating cash flow and the profitability of the company.Amah *et al.* (2016) revealed that cash flow from operating activities has a significant and strong relationship while cash flow from investing and financing activities has negative and weak relationship with performance of the sampled banks. Gheshlaghi*et al.* (2014) showed that there is negative relationship between cash flows from investments activities and return on assets. Also, there is no relationship between cash flows from operational activities and financing activities and return on assets. Based on it, this study develops the following hypothesis:

H$_6$: There is a positive relationship between operating cash flow to total assets and bank's financial performance.

Rate of bank's ability to return deposits

Ishaya and Abduljeleel (2014) observed that debt is negatively related with profitability but equity is directly related with profitability. Naceur and Goiaed (2001) concluded that the best performing banks are those who maintained a high level of deposit accounts relative to their equity which indicates that increasing the ratio of total deposits to total assets means increasing the funds available to use by the bank in different profitable ways such as investments and lending activities. Diamond and Dybvig (1983) found that it is not the borrowing or leverage of the financial sector that is salient but rather the proportion of debt that is comprised of short-term demandable deposits and showed that the higher the rate of bank's ability to return deposits higher will be the firm's financial performance. Abioro (2013) revealed that there is a positive relationship between bank's ability to return deposits and financial performance. Majid (2003) found that there is a positive impact of bank's ability to return deposits and financial performance. Nyanga (2012) bank's ability to return deposits has a positive impact on ROE. Based on it, this study develops the following hypothesis:

H7: There is a positive relationship between rate of bank's ability to return deposits and bank's financial performance.

III. Results and discussion

Descriptive statistics

Table 2 presents the descriptive statistics of the selected dependent and independent variables during the period 2014/15 to 2021/22.

Table 2

Descriptive statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.23	2.79	1.55	0.49
ROE	0.28	54.07	15.61	6.37
WC	14.70	25.87	22.08	1.78
LDR	58.46	98.08	83.92	7.49
CAR	7.49	17.91	13.13	1.62
NPL	0.02	7.33	1.46	1.10
CR	0.38	51.60	5.64	5.01
OTA	0.02	25.29	3.99	3.60
RBARD	0.69	131.74	15.18	15.27

Source: SPSS output

This table shows the descriptive statistics of dependent and independent variables of 16 Nepalese commercial banks for the study period of 2014/15 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 WC (Working capital as measured by current assets deducted by current liabilities, NRs. in billion, LDR (Loan to deposit ratio as measured by the total loan to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage), CR (Cash asset ratio as measured by cash and cash equivalent to total assets, in percentage), OTA (Operating cash flow to total assets as measured by operating cash flow to total assets, in percentage) and RBARD (Rate of bank's ability to return deposits as measured by total equity to total deposits, 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 presents Pearson's correlation coefficient matrix of the selected dependent and independent variables during the period 2014/15 to 2021/22.This table shows the bivariate Pearson's correlation coefficients of dependent and independent variables of 16 Nepalese commercial banks for the study period from 2014/15 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 WC (Working capital as measured by current assets deducted by current liabilities, NRs. in billion, LDR (Loan to deposit ratio as measured by the total loan to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage), CR (Cash asset ratio as measured by cash and cash equivalent to total assets, in percentage), OTA (Operating cash flow to total assets as measured by operating cash flow to total assets, in percentage) and RBARD (Rate of bank's ability to return deposits as measured by total equity to total deposits, in percentage).

Table 3

Pearson's correlation coefficients matrix

Variables	ROA	ROE	WC	LDR	CAR	NPL	CR	OTA	RBARD
ROA	1								
ROE	0.494**	1							
WC	0.122	0.103	1						
LDR	-0.292**	-0.458**	-0.11	1					
CAR	-0.052	-0.415**	-0.028	0.357**	1				
NPL	-0.038	-0.040	-0.013	-0.401**	-0.193*	1			
CR	0.115	-0.076	0.200*	0.032	0.182*	-0.008	1		
OTA	0.193*	0.101	-0.088	-0.153	-0.062	0.134	0.051	1	
RBARD	0.006	-0.113	0.076	0.174*	0.131	-0.061	0.026	-0.084	1

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

Table 3 shows that working capital has a positive relationship with return on assets. It means that increase in working capital leads to increase in return on assets. However, there is a negative relationship of loan to deposit ratio with return on assets. It shows that higher the loan to deposit ratio, lower would be the return on assets. Similarly, there is also a negative relationship between capital adequacy ratio and return on assets. It indicates that increase in capital adequacy 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. In contrast, this study shows that there is a positive relationship between cash asset ratio and return on assets. It means that higher the cash asset ratio higher would be the return on assets. Likewise, operating cash flow to total assets is positively correlated with return on assets which indicates that increase in operating cash flow to total assets will increase return on assets. Moreover, there is a positive relationship between return on assets and rate of bank's ability to return deposits which means that the higher the rate of bank's ability to return deposits, higher will be the return on assets.

On other hand, the result also shows that working capital has a positive relationship with return on equity. It means that increase in working capital leads to increase in return on equity. However, there is a negative relationship between loan to deposit ratio and return on equity. It means that increase in loan to deposit ratio leads to decrease in return on equity. Similarly, there non- performing loan is also negatively correlated with 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 indicates that increase in non-performing loan leads to decrease in return on equity. Furthermore, unlike return on assets there is a negative relationship between cash asset ratio and return on equity. It means that higher the cash asset ratio lower will be return on equity. To be added, there is a positive relationship between operating cash flow to total asset and return on equity which indicates that increase in operating cash asset ratio will increase return on equity. Lastly, there is a negative relationship between rate of bank's ability to return deposits and return on equity. It means that higher the rate of bank's ability to return deposits 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 working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total assets and rate of bank's ability to return deposits with return on asset of Nepalese commercial banks.

Table 4 presents an estimated regression results of working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total assets and rate of banks' ability to return deposits on return on assets.The results are based on panel data of 16 commercial banks with 128 observations for the period of 2014/15-2021/22 by using the linear regression model and the model is $ROA = \beta_0 + \beta_1 WC_{it} + \beta_2 LDR_{it} + \beta_3 CAR_{it} + \beta_4 NPL_{it} + \beta_5 CR_{it} + \beta_6 OTA_{it} + \beta_7 RBARD_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net profit to total asset, in percentage). The independent variables are WC (Working capital as measured by current assets deducted by current liabilities, NRs. in billion, LDR (Loan to deposit ratio as measured by the total loan to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage), CR (Cash asset ratio as measured by cash and cash equivalent to total assets, in percentage), OTA (Operating cash flow to total assets as measured by operating cash flow to total assets, in percentage) and RBARD (Rate of bank's ability to return deposits as measured by total equity to total deposits, in percentage).

Table 4 shows that the beta coefficient for working capital is positive with return on assets. It indicates that working capital has positive impact on return on assets. This finding is similar to the findings of Yashim *et al.* (2020). However, the beta coefficient for loan to deposit ratio is negative with return on assets. It indicates that loan to deposit ratio has a negative impact on return on assets. This finding is similar to the findings of Suroso (2022). Similarly, the beta coefficient for capital adequacy ratio is negative with return on assets. It indicates that capital adequacy ratio has a negative impact on return on assets. This finding is consistent with the findings of Sayani*et al.* (2017). Moreover, the beta coefficient for non-performing loans is negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is similar to the findings of Collaku and Aliu (2021). Likewise, the beta coefficient for cash asset ratio is positive with return on assets. It indicates that cash asset ratio has a positive impact on return on assets. This finding is consistent with the findings of Bardia (2007). Also, it can be observed that the beta coefficient of operating cash flow to total assets is positive with return on assets which indicated that there is a positive impact of operating cash flow to total assets on return on assets. This finding is consistent with the findings of Amah *et al.* (2016). Furtheradded, the beta coefficient for rate of bank's ability to return deposits is positive with return on assets which indicates that there is a positive impact of rate of bank's ability to return deposits on return on assets. This finding is consistent with the findings of Abioro (2013).

Table 4

Estimated regression results of working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total assets and rate of bank's ability to return deposits on return on assets

Models	Intercepts	Regression coefficient of							Adj. R_bar $_2$	SEE	F-value
		WC	LDR	CAR	NPL	CR	OTA	RBARD			
1	0.813 (1.514) *	0.033 (1.377) *							0.007	0.487	1.895
2	3.154 (6.726) **		-0.019 (-3.433)						0.078	0.470	11.788
3	1.758 (4.935) **			-0.016 (-0.586)					0.005	0.490	0.344
4	1.575 (21.812) **				-0.017 (-0.424)				0.007	0.491	0.180
5	1.487 (22.842) **					0.011 (1.296) *			0.005	0.488	1.681
6	1.446 (22.682) **						0.026 (2.212) *		0.030	0.482	4.894
7	1.547 (25.224) **							0.031 (0.071)	0.008	0.491	0.005
8	2.550 (3.455) **	0.025 (1.060) *	-0.018 (-3.298)						0.079	0.469	6.461
9	2.436 (3.202) **	0.025 (1.049) *	-0.020 (-3.304)	0.018 (0.644)					0.075	0.470	4.426
10	3.025 (3.718) **	0.022 (0.941)	-0.024 (-3.806)	0.015 (0.539)	-0.078 (0.059)				0.094	0.465	4.300
11	3.185 (3.874) **	0.016 (0.666)	-0.024 (-3.811)	0.008 (0.302)	-0.080 (-1.948)	0.011 (0.054)			0.098	0.464	3.761
12	2.853 (3.441) **	0.021 0.901	-0.023 (-3.601)	0.009 (0.339)	-0.085 (-2.108)	0.009 (1.088)	0.023 (1.987) *		0.119	0.459	3.869
13	2.928 (3.495) **	0.020 0.831	-0.023 (-3.656)	0.008 (0.284)	-0.086 (-2.120)	0.009 (1.092)	0.023 (2.015) *	0.002 (0.702)	0.116	0.460	3.372

*Notes:** and * indicate that the results are significant at one percent and five percent level respectively.*

Table 5 presents an estimated regression results of working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total assets and rate of banks' ability to return deposits on return on equity.

The results are based on panel data of 16 commercial banks with 128 observations for the period of 2014/15-2021/22 by using the linear regression model and the model is ROE = β_0 + β_1 WC_{it} + β_2 LDR_{it} + β_3 CAR_{it} + β_4 NPL_{it} + β_5 CR_{it} + β_6 OTA_{it} + β_7 $RBARD_{it}$ + e_{it} where, the dependent variable is ROE (Return on equity as measured by the ratio of net profit to total equity, in percentage). The independent variables are WC (Working capital as measured by current assets deducted by current liabilities, NRs. in billion, LDR (Loan to deposit ratio as measured by the total loan to total deposit, in percentage), CAR (Capital adequacy ratio as measured by the ratio of total capital to total risk weighted exposure, in percentage), NPL (Nonperforming loan as measured by non-performing loans to total loans, in percentage), CR (Cash asset ratio as measured by cash and cash equivalent to total assets, in percentage), OTA (Operating cash flow to total assets as measured by operating cash flow to total assets, in percentage) and RBARD (Rate of bank's ability to return deposits as measured by total equity to total deposits, in percentage).

Table 5 shows that the beta coefficient for working capital is positive with return on equity. It indicates that working capital has the positive impact on return on equity. This finding is similar to the findings of Lartey and Boadi (2018). Similarly, the beta coefficient for loan to deposit ratio is negative with return on equity. It indicates that credit to deposit ratio has a negative impact on return on equity. This finding is consistent to the findings of Vellanita*et al.* (2019). Likewise, the beta coefficient for capital adequacy ratio is negative with return on equity. It indicates that capital adequacy ratio has a negative impact on return on equity. This finding contradicts with the findings of Farkasdi*et al.* (2021). Moreover, the beta coefficient for non-performing loans is negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is similar to the findings of Dewi and Badjra (2020). Moreover, the beta coefficient for cash asset ratio is negative with return on equity. It indicates that cash asset ratio has negative impact on return on equity. This finding is consistent with the findings of Abdullah and Jahan (2014). Also, it can be observed that the beta coefficient of operating cash flow to total assets is positive with return on equity which indicated that there is a positive impact of operating cash flow to total assets on return on equity. This finding is consistent with the findings of Mauchi*et al.* (2011). Moreover, the beta coefficient for rate of bank's ability to return deposits is negative with return on equity which indicates that there is a negative impact of rate of bank's ability to return deposits on return on equity. This finding is contradicted with the findings of Nyanga (2012).

IV. Summary and conclusion

The study showed that loan to deposit ratio, non-performing loan and capital adequacy ratio has a negative impact on both return on assets and return on equity. Similarly, working capital and operating cash flow have a positive impact on both return on assets and return on equity. Likewise, cash asset ratio and rate of bank's ability to return deposits has a positive impact in return on assets of Nepalese commercial banks. However, cash asset ratio and rate of bank's ability to return deposits has negative impact on return on equity. Likewise, the study also concluded that operating cash flow to total assets followed by working capital is the most influencing factor that explains the changes in the return on asset of Nepalese commercial banks. Similarly, the study also concluded that working capital followed by operating cash flow to total asset is the most influencing factor that explains the changes in return on equity in context of Nepalese commercial banks.

Table 5

Estimated regression results of working capital, loan to deposit ratio, capital adequacy ratio, non- performing loan, cash asset ratio, operating cash flow to total assets and rate of bank's ability to return deposits on return on equity

Models	Intercepts	Regression coefficient of							Adj. R_bar²	SEE	F-value
		WC	LDR	CAR	NPL	CR	OTA	RBARD			
1	7.527 (1.074)	0.366 (1.157)							0.003	6.365	1.338
2	48.333 (8.515)**		-0.390 (-5.788)						0.210	5.687	33.501
3	37.077 (8.774)**			-1.635 (-5.118)					0.166	5.822	26.195
4	15.947 (16.961)**				-0.231 (-0.449)				0.006	6.393	0.202
5	16.156 (18.983)**					-0.097 (-0.857)			0.002	6.380	0.734
6	14.898 (17.700)**						0.178 (1.137)		0.002	6.366	1.293
7	16.326 (20.567)**							-0.047 (-1.278)	0.005	6.357	1.633
8	43.746 (4.883)**	0.189 (0.663)	-0.385 (-5.668)						0.200	5.700	16.895
9	51.035 (5.792)**	0.201 (0.736)	-0.297 (-4.270)	-1.137 -3.551					0.268	5.452	16.512
10	63.305 (6.950)**	0.144 (0.549)	-0.390 (-5.455)	-1.200 (-3.912)	-1.628 (-3.548)				0.331	5.214	16.689
11	62.964 (6.801)**	0.157 (0.584)	-0.390 (-5.434)	-1.187 (-3.786)	-1.625 (-3.526)	-0.023 (-0.234)			0.326	5.234	13.260
12	61.511 (6.497)**	0.181 (0.668)	-0.384 (-5.300)	-1.183 (-3.766)	-1.650 (-3.566)	-0.029 (-0.295)	0.101 (0.763)		0.323	5.243	11.109
13	61.315 (6.397)**	0.185 (0.677)	-0.382 (-5.206)	-1.179 (-3.728)	-1.649 (-3.546)	-0.029 (-0.295)	0.100 (0.751)	-0.005 (-1.160)	0.318	5.264	9.449

*Notes:** and * indicate that the results are significant at one percent and five percent level respectively.*

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