Working Capital Management and Bank Performance of Nepalese Commercial Banks

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Abstract

This study examines the relationship between working capital management and bank performance of Nepalese commercial bank. Return on assets and return on equity are selected as the dependent variables. Similarly, working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio are selected as the independent variables. This study is based on secondary data of 15 commercial banks with 105 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, reports published by Ministry of Finance, and annual report of respective banks. The correlation coefficients and regression models are estimated to test the significance and importance of working capital management on the performance of Nepalese commercial banks.

The study showed that working capital, bank size, liquidity ratio and capital adequacy ratio have a positive impact with return on assets. It indicates that increase in working capital, bank size, liquidity ratio and capital adequacy ratio leads to increase the return on assets. However, leverage, non-performing loan, credit to deposit ratio and operational efficiency ratio have a negative impact with return on assets. It indicates that increase in leverage, non-performing loan, credit to deposit ratio and operational efficiency ratio leads to decrease the return on assets. On the other hand, the study also showed that working capital, bank size, liquidity ratio and capital adequacy ratio have a positive impact with return on equity. It indicates that increase in working capital, bank size, liquidity ratio and capital adequacy ratio leads to increase the return on equity. However, leverage, non-performing loan, credit to deposit ratio and operational efficiency ratio have a negative impact with return on equity. It indicates that increase in leverage, non-performing loan, credit to deposit ratio and operational efficiency ratio leads to decrease the return on equity.

Keywords: return on assets, return on equity, working capital, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio, operational efficiency ratio

1. Introduction

Working capital management (WCM) is the trade between the liquidity and profitability goals of the organization and the risk. It deals with the current assets and current liabilities of the organization and directly affects

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the liquidity and profitability of the business. Working capital management is defined as a managerial accounting strategy which aims to maintain a sufficient level of working capital (current assets and current liabilities) with respect to each other to ensure that the firm has adequate cash to respond to immediate demands by the debt holders and to manage daily operations (Raheman and Nasr, 2007). WCM is a crucial component of a company's overall strategy to increase the value of its assets. WCM also assists a firm in improving its operational performance and achieving short-term liquidity. Businesses will aim to maintain an ideal amount of working capital to optimize their worth. In addition, effective WCM is vital for businesses, since it substantially impacts their performance and liquidity. WCM's fundamental purpose is to achieve the best possible balance between its many components (Mathuva, 2010).

Singh and Pandey (2008) examined the impact of working capital management on profitability of Hindalco Industries Limited. The study showed that the management of working capital is essential as it has a direct impact on profitability and liquidity. Banking service contributes to economic growth by producing the financial means to facilitate production in other industries. However, the banking firms sometimes find it difficult to finance its operation. This financing problem also affects the management of working capital of the banks which affect their level of profitability (Goddard et al., 2004). Yeboah and Yeboah (2014) examined the working capital management of Ghanaian banks on profitability during the period 2005– 2010 using panel regression models. More specifically, the study investigated whether the working capital management of selected Ghana banks is associated with more profitability. The study findings suggested that cash conversion cycle is inversely related to bank's profitability marginally. In particular, the study also found that leverage of the banks exhibit statistically significantly and has a positive impact on banks' profitability. Jaworski and Czerwonka (2022) examined the relationships between measures of working capital management and profitability of companies listed on the Warsaw Stock Exchange. The result showed that there is a significant non-linear relationship between working capital and profitability. Similarly, Tjandra *et al.* (2022) analyzed and identified determinants of working capital of manufacturing firms listed on Indonesia and Philippines Stock Exchanges. The study showed a positive relationship between working capital and profitability. Furthermore, Jalal *et al.* (2022) investigated the relationship between working capital management and profitability of local banks in Iraq. The study found that working capital management has a positive relationship with profitability.

Samiloglu and Demirgunes (2008) investigated the effect of working capital management on firm profitability using a sample of 5,843 Turkish listed

manufacturing companies for the period of 1998- 2007. The results showed that accounts receivables period, inventory period and leverage significantly and negatively affect profitability of Turkish manufacturing firms. However, the study asserted that firm growth (in sales) significantly and positively affects firm profitability. Falope and Ajilore (2009) examined working capital management and corporate profitability using panel data analysis of selected 50 quoted companies in Nigeria for the period 1996-2005. The study found a significant negative relationship between net operating profitability and cash conversion cycle. Furthermore, the study found no significant variations in the effects of working capital management between large and small firms. Deloof (2003) assessed the relationship between working capital and corporate profitability by using a sample of 1,009 of large Belgian non-financial firms for a period of 1992- 1996. By using correlation and regression tests, the study found a significant negative relationship between gross operating income and the CCC of Belgian firms. In the same manner, Lazaridis and Tryfonidis (2006) investigated the relationship between working capital management and corporate profitability of listed company in the Athens Stock Exchange. The study conducted a panel study by using a sample of 131 firms listed on the Athens Stock Exchange for the period of 2001–2004. The result from regression analysis showed that, there is statistically significant relationship between profitability that is measured through gross operating profit and the cash conversion cycle.

Abuzayed (2012) examined the effect of working capital management on firms' performance for a sample of firms listed on a small emerging market, namely Amman Stock Exchange. The study found that profitability is affected positively with the cash conversion cycle. This indicates that more profitable firms are less motivated to manage their working capital. In addition, financial markets failed to penalize managers for inefficient working capital management in emerging markets. Excessive working capital might lead to lower returns on assets and equity, as it could indicate that a bank is overly conservative in its lending activities. On the other hand, inadequate working capital could increase a bank's risk of default. Working capital is part of a bank's overall capital structure (Abdulnafea et al., 2022). Adequate working capital can contribute to a bank's capital adequacy, ensuring it has a sufficient buffer to absorb losses and meet regulatory requirements. Efficient working capital management can lead to improved operational efficiency. For example, effective management of receivables and payables can optimize cash flows and reduce costs. High levels of working capital might indicate that a bank is cautious in extending credit, leading to lower default risk and better asset quality (Padachi, 2006). However, excessively high working capital might also

imply underutilization of funds and potential missed revenue opportunities. Banks make money by earning a higher interest rate on loans and investments compared to the interest paid on deposits and borrowings. An appropriate level of working capital can affect a bank's ability to generate a positive interest rate spread. Adequate working capital is essential for a bank's liquidity management. Banks need sufficient liquidity to meet customer demands for withdrawals and handle unexpected funding needs. Insufficient working capital might lead to liquidity shortages and negatively impact a bank's ability to meet its obligations (Godswill et al., 2018).

In the context of Nepal, Budhathoki *et al.* (2020) examined the impact of liquidity, leverage, and total assets size of the bank on profitability. The study revealed that lower leverage positively affects the financial performance as measured by ROA. Chhetri (2021) investigated the effect of credit risk on the financial performance of commercial banks in Nepal. The study revealed that capital adequacy ratio (CAR) and bank size (BS) have negative but statistically no significant impact on financial performance (ROA). Moreover, 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. Bam *et al*. (2015) examined the determinants of profitability of Nepalese commercial banks. The result showed that there is a positive relationship of loan to deposit ratio with the ROA. Likewise, Ojha (2018) assessed the relationship between liquidity and bank specific variables in Nepalese commercial banks. The result of the study showed that leverage has a positive and significant correlation with return on assets but negative and significant correlation with return on equity.

The above discussion shows that empirical evidences vary greatly across the studies on the relationship between working capital management and bank performance bank**.** 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 working capital management on the performance of Nepalese commercial banks. Specifically, it examines the relationship of working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio with return on assets and return on equity of Nepalese commercial banks.

The remainder of this study is organized as follows. Section two describes

the sample, data and methodology. Section three presents the empirical results and the final sections draws the conclusion.

2. Methodological aspects

The study is based on the secondary data which were gathered from 15 commercial banks for the period from 2015/16 to 2021/22, leading to a total of 105 observations. The study employed purposive sampling method. 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 commercial banks	Study period	Observations
	Public Banks		
1	Nepal Bank Limited	2015/16 – 2021/22	7
2	Agricultural Development Bank Limited	2015/16 – 2021/22	7
3	Rastriya Banijya Bank Limited	2015/16 – 2021/22	7
	Joint Venture Banks		
4	NMB Bank Limited	2015/16 – 2021/22	7
5	Everest Bank Limited	2015/16 – 2021/22	7
	Private Banks		
6	NIC Asia Bank Limited	2015/16 – 2021/22	7
7	Machhapuchchhre Bank Limited	2015/16 – 2021/22	7
8	Sanima Bank Limited	2015/16 – 2021/22	7
9	Sunrise Bank Limited	2015/16 – 2021/22	7
10	Prime Bank Limited	2015/16 – 2021/22	7
11	Siddhartha Bank Limited	2015/16 – 2021/22	7
12	Nepal SBI Bank Limited	2015/16 – 2021/22	7
13	Citizens Bank International Limited	2015/16 – 2021/22	7
14	Laxmi Bank Limited	2015/16 – 2021/22	7
15	Standard Chartered Bank Nepal Limited	2015/16 – 2021/22	7
Total number of observations			105

Thus, the study is based on the 105observations

The model

The model used in this study assumes that the bank's performance depends upon working capital and other bank specific factors. The dependent variables selected for the study are return on assets and return on equity. Similarly, the selected independent variables are working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio. Therefore, the model takes the following form:

Bank Performance= *f* (working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio)

More specifically,

$$ROA = \beta_0 + \beta_1 WC + \beta_2 BS + \beta_3 LEV + \beta_4 LQR + \beta_5 CAR + \beta_6 NPL + \beta_7 CDR + \beta_8 OER + e$$

$$ROE = \beta_0 + \beta_1 WC + \beta_2 BS + \beta_3 LEV + \beta_4 LQR + \beta_5 CAR + \beta_6 NPL + \beta_7 CDR + \beta_8 OER + e$$

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, Rs. in billions

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

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

LQR = Liquidity ratio as measured by the ratio of current assets to current liabilities 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.

CDR= Credit to deposit ratio as measured by the total loan to total deposit,

in percentage.

OER= Operational efficiency ratio as measured by the ratio of operating expenses to operating income, in percentage.

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

Working capital

Working capital is concerned with maximizing liquidity, profitability and shareholder value (Muniraju and Kumar, 2018). Rosida and Aisyah (2021) determined the effect of intellectual capital and working capital on the projected profitability of return on assets (ROA). The study found that working capital has a significant positive effect on return on assets (ROA). Likewise, Senan et al. (2021) concluded that there is a significant positive impact of working capital on financial performance. Similarly, Jaworski and Czerwonka (2022) found that there is significant and positive association between working capital and profitability. Furthermore, Tjandra et al. (2022) concluded a positive relationship between working capital and profitability. In additional, Jalal et al. (2022) found that working capital management has a positive relationship with profitability. Based on it, this study develops the following hypothesis:

H_1: There is a positive relationship between working capital and bank performance.

Bank size

Firms with large size have the advantage of economies of scale thereby leading to efficiency in comparison to firms with small size. Small firms are likely to face difficulty as it relates to competing with large firms in highly competitive markets due to the fact that smaller firms are likely to have lesser power (Omondi and Muturi, 2013). Irawati and Maksum (2018) assessed the impact of risk management and bank size on profitability of commercial banking in Indonesia. The study concluded that bank size has a positive and significant effect toward return on assets. Likewise, Maina and Kamau (2019) found that there is a positive relationship between bank size and profitability. Similarly, Parvin et al. (2019) indicated that bank size had a positive relation with return on asset. Furthermore, Anggari and Dana (2020) concluded that bank size has a positive and significant effect on profitability. In addition, Ahmed (2022) concluded that there is a positive and significant relationship between bank size and return on assets. Based on it, this study develops the following hypothesis:

H_2: There is a positive relationship between bank size and bank performance.

Leverage

Leverage ratio is used to measure how much the company's assets are financed with debt. Rahman et al. (2020) examined the impact of financial leverage on firm's profitability in the listed textile sector of Bangladesh. The study concluded that there is significant negative relationship between leverage and firm's profitability. Likewise, Djamaluddin and Herawaty (2019) found that leverage has a significant negative association with return on assets. Similarly, Bunyaminu et al. (2021) showed that leverage has significant negative effect on banks profitability. Furthermore, Shafai (2022) concluded that leverage has a negative impact on the bank profitability. In addition, Uddin (2022) found that leverage as measured by the debt-equity ratio (DER) has a negative and insignificant influence on profitability (ROA). Based on it, this study develops the following hypothesis:

H_3: There is a negative relationship between leverage and bank performance.

Liquidity ratio

Liquidity ratio is a financial metric used to assess a company's short-term solvency and its ability to meet its immediate financial obligations. Ndoka et al. (2017) examined the impact of liquidity risk management on the performance of Albanian Commercial Banks during the period 2005-2015. The study found that liquidity ratio has a significant positive effect on the profitability of commercial banks operating in Albania. Likewise, Khan and Ali (2016) found that there is a significant positive relationship between liquidity with profitability of the banks. Similarly, Madushanka and Jathurika (2018) concluded that liquidity ratios have positive and significant relationship with the firm profitability. Furthermore, Abbas et al. (2021) found that there is a positive relationship between liquidity and profitability of the banks. In addition, Haddad et al. (2022) concluded that there is a significant positive association between liquidity ratio and Jordan banks' performance. Based on it, this study develops the following hypothesis:

H_4: There is a positive relationship between liquidity ratio and bank performance.

Capital adequacy ratio

Capital adequacy ratio is the ratio of primary and supplementary capital to risk weighted assets. It is a reflection of the inner strength of a bank, which

would stand it in good stead during times of crisis. Hallunovi and Berdo (2018) assessed the relationship between credit risk management and profitability in commercial banks in Albania. The study found that capital adequacy has a positive relationship with return on assets and return on equity. Likewise, Ukinamemen and Ozekhome (2019) concluded that there is a positive and significant impact of capital adequacy ratio on the financial performance of banks in Nigeria. Similarly, Nguyen (2020) found that capital adequacy has a positive impact on return on assets for small-sized banks. Jadhav et al. (2021) examined impact of capital adequacy ratio on the profitability of private sector banks in India. The result revealed that capital adequacy ratio has a positive impact on banks profitability. Likewise, Thyovani and Manda (2022) investigated the influence of capital adequacy ratio and non-performing loan on return on asset. The study concluded that capital adequacy ratio has a positive and significant effect on asset returns. Based on it, this study develops the following hypothesis:

H_5: There is a positive relationship between capital adequacy ratio and bank performance.

Non-performing loan

The level of a credit crunch is usually proxies by the ratio of bank's non - performing loans (NPL). Alshebmi et al. (2020) assessed the effect of non-performing loans on the profitability of banks in Saudi Arabia. The study found that non-performing loans have a negative and weak relationship with return on assets. Likewise, Saleh and Winarso (2021) concluded that non-performing loan has a negative and significant impact on return on assets. Similarly, Harjanti and Farhan (2021) found that non-performing loan has a significant negative effect on the profitability of banks. Furthermore, Jati (2021) determined the effect of non-performing loans and capital adequacy ratio on return on assets. The study concluded that non-performing loans have a significant effect on return on assets. In addition, Swandewi and Purnawati (2021) analyzed the effect of non-performing loans on return on assets. The study found that non-performing loan has a negative and significant relationship with return on assets. Based on it, this study develops the following hypothesis:

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

Credit to deposit ratio

Credit to deposit ratio (CDR) is used to analyze a bank's liquidity by comparing a bank's total loans to total deposits for the same period. Supriyono and Herdhayinta (2019) analyzed the determinants of bank profitability. The study found that credit to deposit ratio has a negative relationship with profitability. Likewise, Vellanita et al. (2019) revealed a negative relationship between loan to deposit ratio and return on equity. Similarly, Hasan et al. (2022) concluded that there is a significant and negative effect of credit to deposit ratio on return on equity. Furthermore, Widyakto and Wahyudi (2021) found that credit deposit ratio has significant negative impact on return on assets. In addition, Suroso (2022) found that credit to deposit ratio has a negative effect on both return on assets and return on equity. Sihotang et al. (2022) found that there is a significant relationship between credit to deposit ratio and ROA. Based on it, this study develops the following hypothesis:

H_7: There is a negative relationship between credit to deposit ratio and bank performance.

Operational efficiency ratio

Operational efficiency is the key factor contributing to banks success or failure. Christaria and Kurnia (2016) determined the impact of financial ratios, operational efficiency and non-performing loan towards commercial bank profitability. The study found that operational efficiency proxies by operational expense to operating income ratio have a significant negative impact towards banking profitability. Likewise, Sitompul and Nasution (2019) found that operation cost to operation revenue has a significant negative effect on return on assets of Islamic Commercial Banks in Indonesia. Similarly, Kusumastuti and Alam (2019) concluded that operational expense to operating income ratio has a significant negative effect on return on assets. Furthermore, Al-Homaidi et al. (2020) found that operation efficiency ratio has a negative significant impact on return on assets. Rakkarnsil and Butsalee (2022) found that the profitability has a statistically significant effect on operational efficiency. Based on it, this study develops the following hypothesis:

H_8: There is a negative relationship between operational efficiency ratio and bank performance.

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 15 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 income to total assets, in percentage), 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, Rs. in billion), BS (Bank size as measured by total assets, Rs. in Billions), LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), LR (Liquidity ratio as measured by the ratio of total loans to total deposits, 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), CDR (Credit to deposit ratio as measured by the total loan to total deposit, in percentage) and OER (Operating efficiency ratio is measured by the ratio of operating expenses to operating income in percentage).

Variables	Minimum	Maximum	Mean	S.D.
ROA	0.70	2.77	1.54	.43
ROE	6.26	23.38	13.44	3.56
WC	2.07	47.61	14.53	7.93
BS	54.41	358.57	144.88	67.41
LEV	63.56	93.96	88.59	3.52
LQR	3.23	36.21	15.51	9.63
CAR	10.20	22.99	14.18	2.43
NPL	0.01	4.75	1.29	1.20
CDR	58.46	96.69	85.22	7.71
OER	21.28	77.40	44.71	8.60

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 15 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 income to total assets, in percentage), 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, Rs. in billion), BS (Bank size as measured by total assets, Rs. in Billions), LEV (Leverage as measured by the ratio of total debt to total assets,

in percentage), LR (Liquidity ratio as measured by the ratio of total loans to total deposits, 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), CDR (Credit to deposit ratio as measured by the total loan to total deposit, in percentage) and OER (Operating efficiency ratio is measured by the ratio of operating expenses to operating income in percentage).

Variables	ROA	ROE	WC	BS	LEV	LQR	CAR	NPL	CDR	OE
ROA	1									
ROE	0.489**	1								
WC	0.244*	0.008	1							
BS	0.437**	0.062	0.462**	1						
LEV	-0.061	-0.077	-0.144	-0.163	1					
LQR	0.044	0.068	-0.07	-0.122	0.420**	1				
CAR	0.380**	0.208*	0.087	-0.066	0.103	0.09	1			
NPL	-0.230*	-0.015	-0.105	0.236*	-0.104	-0.205*	0.065	1		
CDR	-0.158	-0.342**	-0.025	0.015	0.166	0.188	-0.001	-0.181	1	
OER	-0.497**	-0.382**	0.111	0.301**	0.096	0.17	-0.007	0.158	0.107	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 indicates that increase in working capital leads to increase in return on assets. Likewise, bank size has a positive relationship with return on assets. It indicates that increase in bank size leads to increase in return on assets. In contrast, leverage has a negative relationship with return on assets. It indicates that increase in leverage leads to decrease in return on assets. Further, liquidity ratio has a positive relationship with return on assets. It indicates that increase in liquidity ratio leads to increase in return on assets. Furthermore, capital adequacy ratio has a positive relationship with return on assets. It indicates that increase in capital adequacy ratio leads to increase in return on assets. However, 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. Likewise, credit to deposit ratio has a negative relationship with return on assets. It indicates that decrease in credit to deposit ratio leads to decrease in return on assets. Similarly, operational efficiency ratio has a negative relationship with return on assets. It indicates that increase in operational efficiency ratio leads to decrease in return on assets.

Similarly, working capital has a positive relationship with return on equity. It indicates that increase in working capital leads to increase in return on equity. Likewise, bank size has a positive relationship with return on equity.

It indicates that increase in bank size leads to increase in return on equity. In contrast, leverage has a negative relationship with return on equity. It indicates that increase in leverage leads to decrease in return on equity. Further, liquidity ratio has a positive relationship with return on equity. It indicates that increase in liquidity ratio leads to increase in return on equity. Furthermore, capital adequacy ratio has a positive relationship with return on equity. It indicates that increase in capital adequacy ratio leads to increase in return on equity. However, 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. Likewise, credit to deposit ratio has a negative relationship with return on equity. It indicates that decrease in credit to deposit ratio leads to decrease in return on equity. Similarly, operational efficiency ratio has a negative relationship with return on equity. It indicates that increase in operational efficiency ratio leads to decrease in return on equity.

Regression analysis

Having indicated the Pearson's correlation coefficients, the regression analysis has been carried out and results are presented in Table 4. More specifically, it shows the regression results of working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio on return on assets of Nepalese commercial banks.

Table 4

Estimated regression results of working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio on return on assets

The results are based on panel data of 15 commercial banks with 105 observations for the study period from 2015/16 to 2021/22 by using linear regression model. The model is ROA $= \beta_0 + \beta_1$ WC $+ \beta_2$ BS$+ \beta_3$ LEV $+ \beta_4$ LQR $+ \beta_5$ CAR $+ \beta_6$ NPL $+ \beta_7$ CDR $+ \beta_8$ OER $+$ e Where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are WC (Working capital as measured by current assets deducted by current liabilities, Rs. in billion), BS (Bank size as measured by total assets, Rs. in Billions), LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), LR (Liquidity ratio as measured by the ratio of total loans to total deposits, 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), CDR (Credit to deposit ratio as measured by the total loan to total deposit, in percentage) and OER (Operating efficiency ratio is measured by the ratio of operating expenses to operating income in percentage).

Model	Intercept	Regression coefficients of								Adj. R_bar^2	SEE	F-value
		WC	BS	LEV	LQR	CAR	NPL	CDR	OER			
1	1.734 (20.322)**	0.013 (2.556)*								0.051	0.421	6.535
2	1.944 (21.616)**		0.003 (4.924)**							0.183	0.392	24.247
3	0.888 -0.836			-0.007 (0.621)						0.006	0.433	0.38
4	1.515 -0.002				0.002 (0.451)					0.008	0.435	0.199
5	0.595 (2.579)*					0.067 (4.164)**				0.136	0.434	17.342
6	1.437 (23.891)**						-0.082 (2.394)*			0.044	0.425	5.73
7	2.292 (4.954)**							-0.01 (1.634)		0.016	0.438	2.649
8	2.649 (13.656)**								-0.025 (5.809)**	0.239	0.375	33.744
9	1.963 (20.207)**	0.003 (0.538)	0.003 (4.102)**							0.177	0.394	12.184
10	1.451 -1.368	0.013 (2.480)*	0.006 (4.252)**	-0.003 (0.274)						0.042	0.425	3.274
11	1.972 (16.187)**	0.003 (0.537)	0.005 (4.073)**	-0.006 (1.168)	0.001 (0.111)					0.169	0.393	8.049
12	1.052 (4.654)**	0.006 (1.168)	0.002 (3.892)**	-0.005 (1.228)	0.006 (1.168)	0.064 (4.411)**				0.303	0.362	16.078
13	1.026 (4.690)**	0.001 (0.153)	0.003 (5.198)**	-0.002 (1.118)	0.009 (0.273)	0.057 (4.128)**	-0.116 (3.826)**			0.384	0.345	13.949
14	1.781 (4.002)**	0.006 (1.249)	0.002 (3.861)**	-0.008 (1.143)	0.007 (0.153)	0.065 (4.453)**	-0.198 (4.859)**	-0.011 (1.854)		0.315	0.363	10.545
15	2.397 (2.641)**	0.007 (1.547)	0.001 (2.512)*	-0.005 (1.435)	0.003 (0.856)	0.065 (4.992)**	-0.224 (4.253)**	-0.014 (1.713)	-0.021 (5.287)**	0.457	0.322	13.526

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 working capital are positive with return on assets. It indicates that working capital has a positive impact on return on assets. This finding is consistent with the findings of Jalal *et al.* (2022). Likewise, the beta coefficients for firm size are positive with return on assets. It indicates that firm size has a positive impact on return on assets. This finding is consistent with the findings of Ahmed (2022). Similarly, the beta coefficients for leverage are negative with return on assets. It indicates that leverage has a negative impact on return on assets. This finding is consistent with the findings of Uddin (2022). Further, beta coefficients for liquidity ratio are positive with return on assets. It indicates that liquidity ratio has a positive impact on return on assets. This finding is consistent with the findings of Haddad *et al.* (2022). Furthermore, beta coefficients for capital adequacy ratio are positive with return on assets. It indicates that capital adequacy ratio has a positive impact on return on assets. This finding is consistent with the findings of Thyovani and Manda (2022). However, beta coefficients for non-performing loan are negative with return on assets. It indicates that non-performing loan has a negative impact on return on assets. This finding is consistent with the findings of Swandewi and Purnawati (2021).

Table 5 shows the estimated regression results of working capital, bank

size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio on return on equity of Nepalese commercial banks.

Table 5

Estimated regression results of working capital, bank size, leverage, liquidity ratio, capital adequacy ratio, non-performing loan, credit to deposit ratio and operational efficiency ratio on return on equity

The results are based on panel data of 15 commercial banks with 105 observations for the study period from 2015/16 to 2021/22 by using linear regression model. The model is ROE = $\beta_0 + \beta_1$ WC + β_2 BS+ β_3 LEV + β_4 LQR + β_5 CAR + β_6 NPL + β_7 CDR + β_8 OER + e where, the dependent variable is ROE (Return on equity as measured by the ratio of net income to total equity, in percentage). The independent variables are WC (Working capital as measured by current assets deducted by current liabilities, Rs. in billion), BS (Bank size as measured by total assets, Rs. in Billions), LEV (Leverage as measured by the ratio of total debt to total assets, in percentage), LR (Liquidity ratio as measured by the ratio of total loans to total deposits, 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), CDR (Credit to deposit ratio as measured by the total loan to total deposit, in percentage) and OER (Operating efficiency ratio is measured by the ratio of operating expenses to operating income in percentage).

Model	Intercept	Regression coefficients of								Adj. R_bar^2	SEE	F-value
		WC	BS	LEV	LQR	CAR	NPL	CDR	OE			
1	13.382 (18.288)**	0.004 (0.081)								0.011	3.582	0.007
2	13.908 (16.760)**		0.234 (0.631)							0.006	3.576	0.393
3	6.491 (18.736) **			-0.078 (0.791)						0.004	3.572	0.621
4	13.047 (19.676)**				0.025 (0.691)					0.005	3.574	0.476
5	17.742 (8.744)**					0.304 (2.153)*				0.034	3.546	4.635
6	13.38 (26.041)**						-0.043 (0.153)			0.009	3.582	0.022
7	26.929 (7.353)**							-0.158 (3.699)		0.109	3.367	13.685
8	20.506 (11.935)**								-0.158 (4.190)**	0.137	3.313	17.554
9	13.768 (15.349)**	0.021 (0.425)	0.456 (0.758)							0.014	3.593	0.283
10	7.113 (0.771)	0.024 (0.472)	0.886 (0.663)	-0.074 (0.731)						0.019	3.632	0.363
11	8.311 (0.843)	0.024 (0.474)	0.557 (0.648	-0.058 (0.518)	0.014 (0.354					0.028	3.612	0.301
12	10.935 (1.123)	0.053 (1.038)	0.016 (1.149	-0.089 (0.737)	0.025 (0.628	0.362 (2.474)*	-0.296 (0.916)			0.016	3.531	1.284
13	21.904 (2.309)*	0.046 (0.828)	0.024 (0.793	-0.121 (1.187)	0.041 (1.089	0.359 (2.634)**	-0.08 (0.277)	-0.173 (3.975)**		0.145	3.294	3.523
14	24.301 (2.837)**	0.044 (1.016)	0.223 (0.369	-0.151 (1.627)	0.073 (2.092)**	0.375 (3.048)**	-0.281 (1.349)	-0.157 (3.969)**	-0.179 (4.836)**	0.305	2.974	6.718

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 working capital are positive with return on equity. It indicates that working capital has a positive impact on return on equity. This finding is similar to the findings of Tjandra (2022). Likewise, the beta coefficients for firm size are positive with return on equity. It indicates that firm size has a positive impact on return on equity. This finding is consistent with the findings of Anggari and Dana (2020). Furthermore, the beta coefficients for capital adequacy ratio are positive with return on equity. It indicates that capital adequacy ratio has a positive impact on return on equity. This finding is similar to the findings of Jadhav *et al*. (2021). However, the beta coefficients for non-performing loan are negative with return on equity. It indicates that non-performing loan has a negative impact on return on equity. This finding is consistent with the findings of Jati (2021). Likewise, the beta coefficients for credit to deposit ratio are negative with return on equity. It indicates that credit to deposit ratio has a negative impact on return on equity. This finding is consistent with the findings of Widyakto and Wahyudi (2021). Similarly, the beta coefficients for operational efficiency ratio are negative with return on equity. It indicates that operational efficiency ratio has a negative impact on return on equity. This finding is similar to the findings of Al-Homaidi *et al.* (2020).

4. Summary and conclusion

Working capital management refers to the process of managing a company's short-term assets and liabilities to ensure smooth operations and sufficient liquidity. Optimizing working capital management can help banks to meet customer demands more effectively, reduce financing costs, and minimize potential solvency issues. Moreover, maintaining an optimal balance between short-term assets and liabilities can contribute to the stability and long-term growth of the banking sector in Nepal. Working capital management is the process of managing a business's current assets and current liabilities. It is important for all businesses, but it is especially important for banks. This is because banks have a lot of short-term assets, such as loans, and a lot of short-term liabilities, such as deposits. If a bank does not manage its working capital effectively, it can run into liquidity problems.

This study attempts to analyze the relationship between working capital management and the performance of Nepalese commercial banks. The study is based on secondary data of 15 commercial banks with 105 observations for the period from 2015/16 to 2021/22.

The study showed that working capital, bank size, liquidity ratio and capital adequacy ratio have a positive impact with return on assets and return

on equity. However, leverage, non-performing loan, credit to deposit ratio and operational efficiency ratio have a negative impact with return on assets and return on equity. The study concluded that good working capital management can help banks to improve their liquidity. This means that they will have more cash on hand to meet their short-term obligations. This can help them to avoid defaulting on loans and to maintain the confidence of their depositors. The study also concluded that bank size, operational efficiency ratio and capital adequacy ratio plays the significant role in explaining the changes in return on assets of Nepalese commercial banks.

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