Impact of Economic Growth on Bank Liquidity: A Case of Nepal

Kamala Kumari Bhatta, Lelina Pokharel, Gaurav Subedi, Kushal Kunwar and
Laxmi Kumari Sah[*]

Abstract

The study examines the impact of economic growth on bank liquidity in the contex of Nepal. Return on assets and cash reserve ratio are selected as the dependent variables. The selected independent variables are GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income. The study is based on secondary data of 10 commercial banks with 100 observations for the period from 2013/14 to 2022/23. The data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual reports of the selected commercial banks, World Bank and OECD Inflation CPI indicator. The correlation coefficients and regression models are estimated to test the significance and importance of economic growth on bank liquidity: A case of Nepal.

The study showed that GDP growth rate has a positive impact on return on assets and cash reserve ratio. It indicates that higher the GDP growth rate, higher would be the return on assets and cash reserve ratio. Similarly, money supply has a positive impact on return on assets and cash reserve ratio. It indicates that higher the money supply, higher would be the return on assets and cash reserve ratio. Likewise, remittance has a positive impact on return on assets and cash reserve ratio. It indicates that higher the remittance, higher would be the return on assets and cash reserve ratio. Further, per capita income has a positive impact on return on assets and cash reserve ratio. It indicates that higher the per capita income, higher would be the return on assets and cash reserve ratio. However, inflation has a negative impact on return on assets and cash reserve ratio. It indicates that increase in inflation leads to decrease in return on assets and cash reserve ratio. Likewise, bank rate has a negative impact on return on assets and cash reserve ratio. It indicates that higher the bank rate, lower would be the return on assets and cash reserve ratio.

Keywords: return on assets, cash reserve ratio, GDP growth rate, money supply, bank rate, inflation, remittance, per capita income

1. Introduction

The banking industry is the most crucial part of the financial and economic system (Gersl and Hermanek, 2008). It plays a critical role in economic growth at firm, industry and macroeconomic levels (Mittal and Garg, 2021). Banks are financial institutions that play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. Banking system plays an important role in the development of a country's economy and its financial stability (Ryu *et al*., 2012). Banks have a very important function to play in the economic operations of any country as financial intermediary. Banks render services such as resource mobilization and allocation, financial intermediation and facilitation of foreign exchange transactions to enhance international trade (Merna and Al-Thani, 2008). The task of providing funds to the economy makes their performance an important objective of any country. Banks are vital to economic growth because the overall financial systems of most economies in the world are influenced by the banking system (Ali and Anbar, 2011). As financial intermediaries, bank plays a crucial role in the operation of

the economy. Banks insolvencies can result in systematic crisis. Failure of individual banks adversely affects the economy and the society at large (Kolapo *et al.,* 2012). Banks are exposed to different types of risks, which affect the performance and activity of the banks, since the primary goal of the banking management is to maximize the shareholders' wealth. So, to achieve this goal banks' managers should asses the cash flows and the assumed risks as a result of directing its financial resources in different areas of utilization.

Moussa and Trabelsi (2023) examined the impact of economic growth on bank liquidity: case of Tunisia Economic growth. The study found that economic growth has a positive impact on bank liquidity. It indicates that good economic conditions ameliorate the level of bank liquidity. Therefore, banks can meet their financial obligations and increase their investment. Similarly, Beck *et al.* (2023) determined the liquidity creation, investment, and growth. The study revealed that liquidity creation by banks is positively associated with economic growth. Liquidity creation boosts tangible, but not intangible investment and does not contribute to growth in countries with a high share of industries reliant on intangible assets. Likewise, Ismail *et al.* (2024) analyzed the impact of liquidity creation on real economic output: Evidence from full-fledged Islamic banks (FIBs) and hybrid conventional banks (HCBs) for a sample of 10 countries over the 11-year period from 2012–2022. The study revealed that both FIBs and HCBs liquidity creation per capita income have positive impact on real economic output.

Ali and Ahmad (2023) examined the liquidity creation and its impact on economic Growth: Moderating role of firm size on Pakistan. The results revealed that firm size does not moderate the relationship between liquidity creation and gross domestic product. Similarly, Ahamed (2021) analyzed the determinants of liquidity risk in the commercial banks in Bangladesh. The study found that return on equity and capital adequacy ratio have positive but an insignificant relationship with liquidity risks. In the case of macroeconomic factors, inflation negatively affects the liquidity risks, whereas GDP and domestic credit positively affect the liquidity risks. Likewise, Igoni *et al.* (2020) assessed the nexus of monetary policy and per capita income in the Nigerian Economy. The results of the Granger Causality test indicated a significant relationship between per capita income and cash reserve ratio. The study also concluded that cash reserve ratio constitutes a significant relationship with per capita income. Further, Obinna (2022) examined the impact of financial deepening on Nigeria's Per capita income from 1981-2019 using secondary data and ordinary least squares estimation technique. The study found that ratio of broad money supply to GDP has a positive and significant impact on per capita income. In addition, Hoque (2020) analyzed the impact of monetary policy on bank's profitability: A study on listed commercial banks in Bangladesh. The study revealed that cash reserve ratio has a negative impact on return on assets and return on equity.

Kanwal and Nadeem (2013) analyzed the impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan for years 2001-2011. The findings of the study indicated a strong positive relationship of real interest rate with return on assets and return on equity. The study also indicates that real GDP is found to have an insignificant but positive impact on return on assets, but an insignificant negative impact on return on equity. Similarly, Qureshi and Siddiqui (2020) determined the effect of macroeconomic factors on firms' return on assets: A comparative sectorial analysis from Pakistan. The study revealed that inflation, FDI and unemployment have positive influence on return on assets while labor unit cost is negatively affects return on assets whereas exchange rate has an insignificant

but positive relationship with return on assets. The study also revealed that labor unit cost and inflation have negative impact on return on assets whereas foreign direct investment and exchange rate have positive impact on return on assets. The study also stated that unemployment rate has an insignificant but positive impact on return on assets. Likewise, Sutradhar (2020) analyzed the impact of workers' remittances on economic growth of four South Asian emerging countries by employing balanced panel data from 1977 to 2016. The study revealed a negative impact of remittances on economic growth in Bangladesh, Pakistan and Sri Lanka. Conversely, remittances have a positive impact on economic growth in India. This study also indicated a joint significant and negative relationship between remittances and economic growth.

Fidrmuc (2021) examined the effect of banks liquidity creation on economic growth at Russia. The study revealed that liquidity creation by banks significantly influences economic growth. Similarly, Milic (2017) concluded that inflation and unemployment rates are important determinants of liquidity in the banking sector. Likewise, Sathyamoorthi *et al*. (2020) determined the impact of liquidity management on the financial performance of Botswana's commercial banks. The study found a statistically significant and positive relationship of loans-to-total-assets ratio and liquid assets-to-total-assets ratio on return on assets and return on equity. The study also found that loan-to-deposit ratio and liquid assets-to deposit ratio both have statistically significant but negative impact on return on assets and return on equity. Further, Musah *et al.* (2018) examined the effect of interest rate spread on the profitability of commercial banks in Ghana. The results of the study showed that there is a positive and statistically significant association between interest rate spread and bank's profitability in Ghana. In addition, Abbas and Ali (2023) analyzed how economic expansion affects the interplay between capital, liquidity, and profitability in commercial banks. The results showed that bank liquidity and capital are decided concurrently and are dependent on each other.

Bialas and Sole (2010) examined the capital adequacy ratio (CAR) determinants of a bank's core capital to the assets and off-balance liabilities weighted by the risk. The core capital of the bank is supposed to absorb the potential losses due to the risk of the banking activities. Similarly, Al-Tamimi and Obeidat (2013) assessed the determinant of capital adequacy of commercial banks of Jordan. The study showed that there is a statistically significant positive correlation between the degree of capital adequacy in commercial banks and liquidity ratio. Bank capital confirms the safety and soundness of the banks, it also helps the bank to avoid the risk of insolvency, and also to support the credit risk a bank is called upon to assume in a normal business leading (Nzotta, 2009). Likewise, inadequacy of capital creates problems in many banks like as inability to absorb losses arising from costs of operations. Capital provides a cushion to withstand abnormal losses not covered by current earnings, enabling banks to regain equilibrium and to reestablish earnings pattern (Ogubunka, 2003). Gropp and Heider (2010) revealed that more profitable banks or banks that distribute lower dividends tend to hold higher capital buffers, because the benefit from a better ability to accumulate capital from funds generated internally. According to Nier and Baumann (2006), banks increases their capital ratios when they face higher credit risk. Likewise, Distinguin *et al.* (2013) found a negative relationship between buffer in the capital structure and non-performing loan. Further, Ayuso *et al.* (2004) revealed that capital buffer and economic activity tend to be negatively related. Banks tends to decrease their capital buffer during economic booms and increase it during economic downturns. According to

Berger (1995), banks with external growth strategies might increase their capital buffer during economic booms to exploit acquisition opportunities.

Francis (2007) found that capital adequacy and credit risk have positive effect on bank profitability. Similarly, Zribi and Younes (2011) revealed that credit risk in emerging economy than that in developed economies and that risk is formed by a larger number of bank-specific factors in emerging economies compared to their counterparts in developed economies. Likewise, Ruziqa (2013) examined the impact of credit risk and liquidity risk on the financial performance of conventional banks. The results illustrated that credit risk is negatively related to profitability while liquidity risk demonstrated a positive effect. Further, Al-Tamimi and Obeidat (2013) found most important variable which affect the capital adequacy of commercial banks of Jordan in Amman Stock Exchange. The study revealed that there is a statistically significant positive correlation between the degree of capital adequacy in commercial banks and the factors of liquidity risk and there is an inverse relationship between the degree of capital adequacy in commercial banks and factors of the capital risk and credit risk.

In the context of Nepal, Dhungana (2024) examined the liquidity crunches in the banking industry of Nepal. The study found a significant impact of government capital expenditure, bank lending policy, and monetary policy on liquidity crunches in the banking industry. Gautam (2020) examined the financial performance analysis of Nepalese financial institutions in the framework of CAMEL. The study found that inflation rate, return on assets and liquidity have positive and significant impact on core capital. Similarly, Poudel (2018) found that non-performing loan ratio has a significant negative impact on capital adequacy. Likewise, Gnawali (2018) concluded that total loans to total deposits ratio and loan loss provision have a positive relationship with economic growth. In addition, Pradhan and Bam (2016) examined the influence of bank Specific and macroeconomic variables on credit risk of commercial banks and concluded that capital adequacy ratio is a major determinant of credit risk in the context of Nepalese commercial banks. Similarly, Pradhan and Shrestha (2017) examined the impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. The study showed that bank operating efficiency, loan ratio, total deposit to total assets, loan loss provision to total equity have significantly positive impact on core capital ratio.

The above discussion shows that empirical evidences vary greatly across the studies on the impact of economic growth on bank liquidity. 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 major objective of the study is to examine the impact of economic growth on bank liquidity in the context of Nepal. Specifically, it examines the relationship of GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income with bank liquidity in the context of Nepal.

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

2. Methodological aspects

The study is based on the secondary data which were collected from 10 Nepalese commercial banks from 2013/14 to 2021/22, leading to a total of 100 observations. The study employed random sampling method. The main sources of data collected from the data were collected from Bank Supervision Report published by Nepal Rastra Bank (NRB), annual reports of the selected commercial banks, World Bank and OECD Inflation CPI indicator. 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	Nepal Bank Limited	2013/14-2022/23	10
2	Everest Bank Limited	2013/14-2022/23	10
3	Nepal SBI Bank limited	2013/14-2022/23	10
4	Standard Chartered Bank Nepal Limited	2013/14-2022/23	10
5	Agriculture Development Bank Limited	2013/14-2022/23	10
6	Machhapuchchhre Bank Limited	2013/14-2022/23	10
7	NMB Bank Limited	2013/14-2022/23	10
8	Prime Commercial Bank Limited	2013/14-2022/23	10
9	Siddhartha Bank Limited	2013/14-2022/23	10
10	NIC Asia Bank Limited	2013/14-2022/23	10
Total number of observations			**100**

Thus, the study is based on the 100 observations.

The model

The model used in this study assumes that bank liquidity depends upon bank specific and macroeconomics variables. The dependent variables selected for the study are return on assets and cash reserve ratio. Similarly, the selected independent variables are GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income. Therefore, the models take the following forms:

$$ROA = \alpha + \beta_1 GDP_{it} + \beta_2 MS_{it} + \beta_3 BR_{it} + \beta_4 I_{it} + \beta_5 R_{it} + \beta_6 PCI_{it} + e_{it}$$

$$CRR = \alpha + \beta_1 GDP_{it} + \beta_2 MS_{it} + \beta_3 BR_{it} + \beta_4 I_{it} + \beta_5 R_{it} + \beta_6 PCI_{it} + e_{it}$$

Where,

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

CRR = Cash reserve ratio is measured by the percentage of cash required to be kept in reserves as against the bank's total deposits, in percentage.

GDP = Gross domestic product as measured by real gross domestic product, in percentage.

MS = Money supply as measured by broad money supply in the economy in a year, in percentage.

BR = Bank rate is defined as the rate of interest which is charged by a central bank while

lending loans to a commercial banks, in percentage.

INI = Inflation rate is measured by rate of inflation in a particular year, in percentage.

R = Remittance is measured as remittances received by households from international migrants, Rs. in billion.

PCI = Per capita income as measured by the amount of money earned per person in a nation or geographic region, Rs. in billion.

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

GDP growth rate

Trenca *et al.* (2015) examined the macroeconomic determinants of 40 commercial banks in 6 Southern Europe countries (Croatia, Greece, Italy, Portugal, Spain and Cyprus) from 2005 to 2011. The study found that economic growth as measured by GDP has a negative but statistically significant impact on bank's liquidity. Similarly, Jamal *et al*. (2012) analyzed the determinants of commercial banks' return on asset. The result indicated that all the external factors namely inflation, interest rate, and GDP have a positive impact on commercial bank's return on assets while stock market development influence bank's profit negatively. Further, Bunda and Desquilbet (2008) showed that gross domestic product has a positive impact on liquidity of banks. Based on it, this study develops the following hypothesis:

H_1: There is a positive relationship between GDP growth rate and bank liquidity.

Money supply

Matres and Le (2021) investigated the relationship between changes in money supply and various economic indicators across different countries. The findings revealed a significant relationships between money supply and economic performance. Similarly, Lastrapes and McMillin (2004) showed a significant impact of financial prices on the supply of broad money. Likewise, Aulia and Aisyah (2023) analyzed the influence of financing, inflation, and the amount of money supply on the profitability of Syariah bank in Indonesia. The study found that money supply partially has a positive impact on bank profitability measured by return on assets. Further, Sufian and Chong (2008) revealed that money supply and stock capitalization are as the external determinants of bank liquidity. Based on it, this study develops the following hypothesis:

H_2: There is a positive relationship between money supply and bank liquidity.

Bank rate

Chagwiza (2011) examined the Zimbabwean commercial banks' liquidity and its determinants. The study showed that there is a negative association between bank rate and bank liquidity. Similarly, Molyneux *et al.* (2018) found that bank rate has a negative impact on bank liquidity. Likewise, Scheiber *et al.* (2016) revealed a negative impact of bank rates on bank liquidity. However, Musah *et al.* (2018) found a positive and statistically significant association between interest rate spread and bank profitability. Based on it, this study develops the following hypothesis:

H_3: There is a negative relationship between bank rate and bank liquidity.

Inflation

Ahamed (2021) examined the determinants of liquidity risk in the commercial banks in Bangladesh. The study stated that inflation has a negative impact on liquidity. Similarly, Basarda *et al.* (2018) showed that there is a negative but significant relationship between inflation and return on assets. Likewise, Batsinda and Shukla (2019) found that cost push inflation has a negative impact on Profitability of bank. Further, Hakimi and Zagdoudi (2017) demonstrated that inflation has a slightly negative impact on the liquidity ratio. In addition, Prasanto *et al.* (2020) revealed that in the long term as well as long-term inflation have an insignificant and negative influence on return on assets. Based on it, this study develops the following hypothesis:

H$_4$: There is a negative relationship between inflation and bank liquidity.

Remittance

Meyer and Shera (2017) showed that remittances have a positive impact on bank liquidity. Similarly, Shazad *et al. (*2014) investigated the influence of remittances on financial progress. The results showed that remittances have a positive impact on financial sector development. Likewise, Fromentin (2017) anlayzed the influences of remittances on the financial progress for developing economies for the period 1974-2014 by employing a Pooled Mean Group (PMG) approach. The results revealed that there is a positive connection between remittances and financial development in the long term, but not in the short term. Based on it, this study develops the following hypothesis:

H$_5$: There is a positive relationship between remittance and bank liquidity.

Per capita income

Igoni *et al.* (2020) examined the nexus of monetary policy and per capita income in the Nigerian Economy. The result indicated a significant reinforcement between per capita income and cash reserve ratio. Similarly, Naceur and Goaied (2010) analyzed the determinants of bank performance. The study indicated that per capita growth have significant impact on bank performance. Likewise, Athanasoglou *et al.* (2008) stated that banks' profits are not significantly affected by the real GDP per capita fluctuations. Further, Wum *et al.* (2007) examined the impact of financial development and bank characteristics on the operational performance of commercial banks in the Chinese transitional economy. The study revealed that per capita income has a positive impact on return on assets. Based on it, this study develops the following hypothesis:

H$_6$: There is a positive relationship between per capita income and bank liquidity.

3. Results and discussions

Descriptive statistics

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

Table 2

Descriptive statistics

This table shows the descriptive statistics of dependent and independent variables of 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and CRR (Cash reserve ratio is measured by the percentage of cash required to be kept in reserves as against the bank's

total deposits, in percentage). The independent variables are GDP (Gross domestic product as measured by real gross domestic product, in percentage), MS (Money supply as measured by broad money supply in the economy in a year, in percentage), BR (Bank rate is defined as the rate of interest which is charged by a central bank while lending loans to a commercial banks, in percentage), INF (Inflation rate is measured by rate of inflation in a particular year, in percentage), R (Remittance is measured as remittances received by households from international migrants, Rs. in billion) and PCI (Per capita income as measured by the amount of money earned per person in a nation or geographic region, Rs. in billion).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	0.13	3.57	1.543	0.524
CRR	1.71	36.21	16.217	8.696
PCI	824.00	1399.00	1124.500	201.671
MS	1669.10	7115.90	4074.360	1894.234
BR	5.00	8.50	6.900	1.119
R	543.30	1007.31	779.343	144.611
GDP	-2.42	8.59	4.430	3.214
INF	3.60	9.90	6.100	2.007

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 10 Nepalese commercial banks for the study period of 2013/14 to 2022/23. The dependent variables are ROA (Return on assets as measured by the ratio of net income to total assets, in percentage) and CRR (Cash reserve ratio is measured by the percentage of cash required to be kept in reserves as against the bank's total deposits, in percentage). The independent variables are GDP (Gross domestic product as measured by real gross domestic product, in percentage), MS (Money supply as measured by broad money supply in the economy in a year, in percentage), BR (Bank rate is defined as the rate of interest which is charged by a central bank while lending loans to a commercial banks, in percentage), INF (Inflation rate is measured by rate of inflation in a particular year, in percentage), R (Remittance is measured as remittances received by households from international migrants, Rs. in billion) and PCI (Per capita income as measured by the amount of money earned per person in a nation or geographic region, Rs. in billion).

Variables	ROA	CRR	PCI	MS	BR	R	GDP	INF
ROA	1							
CRR	0.070	1						
PCI	0.391**	0.015	1					
MS	0.461**	0.021	0.975**	1				
BR	-0.030	-0.034	-0.301**	-0.364**	1			
R	0.311**	0.019	0.896**	0.910**	-0.614**	1		
GDP	0.098	0.057	0.172	-0.007	0.460**	-0.084	1	
INF	-0.092	-0.011	-0.705**	-0.598**	0.448**	-0.679**	-0.450**	1

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

Table 3 shows that there is positive relationship between per capita income and return on assets. It indicates that increase in per capita income leads to increase in return on assets. Similarly, there is a positive relationship between money supply and return on asset. It indicates that higher the money supply, higher would be the return on assets. However, bank rate has a negative relationship with return on assets. It indicates that increase in bank rate leads to decrease in return on assets. In contrast, there is a positive relationship between remittance and return on assets. It indicates that increase in remittance leads to increase in return on assets. Likewise, GDP growth rate has a positive relationship with return on assets. It indicates that higher the GDP growth rate, higher would be the return on assets. Further, there is a negative relationship between inflation and return on assets. It indicates that higher the inflation, lower would be the return on assets.

Similarly, there is positive relationship between per capita income and cash reserve ratio. It indicates that increase in per capita income leads to increase in cash reserve ratio. Similarly, there is a positive relationship between money supply and cash reserve ratio. It indicates that higher the money supply, higher would be the cash reserve ratio. However, bank rate has a negative relationship with cash reserve ratio. It indicates that increase in bank rate leads to decrease in cash reserve ratio. In contrast, there is a positive relationship between remittance and cash reserve ratio. It indicates that increase in remittance leads to increase in cash reserve ratio. Likewise, GDP growth rate has a positive relationship with cash reserve ratio. It indicates that higher the GDP growth rate, higher would be the cash reserve ratio. Further, there is a negative relationship between inflation and cash reserve ratio. It indicates that higher the inflation, lower would be the cash reserve ratio.

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 GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income with return on assets.

Table 4

Estimated regression results of GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income on return on assets

The results are based on panel data of 10 Nepalese commercial banks with 100 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $ROA = \alpha + \beta_1 GDP_{it} + \beta_2 MS_{it} + \beta_3 BR_{it} + \beta_4 I_{it} + \beta_5 R_{it} + \beta_6 PCI_{it} + e_{it}$ where, the dependent variable is ROA (Return on assets as measured by the ratio of net income to total assets, in percentage). The independent variables are GDP (Gross domestic product as measured by real gross domestic product, in percentage), MS (Money supply as measured by broad money supply in the economy in a year, in percentage), BR (Bank rate is defined as the rate of interest which is charged by a central bank while lending loans to a commercial banks, in percentage), INF (Inflation rate is measured by rate of inflation in a particular year, in percentage), R (Remittance is measured as remittances received by households from international migrants, Rs. in billion) and PCI (Per capita income as measured by the amount of money earned per person in a nation or geographic region, Rs. in billion).

Model	Intercept	Regression coefficients of						Adj. R_bar²	SEE	F-value
		PCI	MS	BR	R	GDP	INF			
1	9.287 (5.049)**	2.544 (4.211)**						0.145	0.484	17.737
2	5.536 (7.119)**		1.122 (5.144)**					0.205	0.467	26.459
3	1.446 (4.378)**			-0.014 (0.299)				0.009	0.526	0.089
4	7.231 (4.120)**				1.972 (3.242)**			0.088	0.500	10.511
5	1.472 (16.450)**					0.016 (0.976)		0.029	0.523	0.953
6	1.396 (8.285)**						-0.024 (0.919)	0.001	0.524	0.844
7	7.628 (1.719)	7.545 (3.009)**	3.875 (4.129)**					0.265	0.449	18.847
8	9.118 (2.102)*	9.309 (3.697)**	4.739 (4.909)**	-0.116 (2.676)**				0.309	0.435	15.751
9	11.570 (2.418)*	7.853 (2.816)**	4.952 (5.056)**	-0.050 (0.712)	2.491 (1.203)			0.312	0.434	12.230
10	16.900 (2.255)*	11.029 (2.492)*	6.011 (3.987)**	-0.032 (0.454)	2.291 (1.099)	0.024 (0.924)		0.311	0.435	9.940
11	20.044 (2.311)*	12.700 (2.541)**	6.401 (3.991)**	-0.089 (0.839)	2.109 (1.002)	0.009 (0.290)	-0.047 (0.726)	0.308	0.436	8.329

Notes:

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

Table 4 shows that the beta coefficients for per capita income are positive with return on assets. It indicates that per capita income has a positive impact on return on assets. This finding is consistent with the findings of Igoni *et al.* (2020). Similarly, the beta coefficients for money supply are positive with return on assets. It indicates that money supply has a positive impact on return on assets. This finding is consistent with the findings of Matres and Le (2021). Likewise, the beta coefficients for bank rate are negative with return on assets. It indicates that bank rate has a negative impact on return on assets. This finding is similar to the findings of Chagwiza (2011). Further, the beta coefficients for remittance are positive with return on assets. It indicates that remittance has a positive impact on return on assets. This finding is consistent with the findings of Meyer and Shera (2017). In addition, the beta coefficients for GDP growth rate are positive with return on assets. It indicates that GDP growth rate has a positive impact on return on assets. This finding is similar to the findings of Jamal *et al.* (2012). Moreover, the beta coefficients for inflation are negative with return on assets. It indicates that inflation has a negative impact on return on assets. This finding is consistent with the findings of Ahamed (2021).

Table 5 shows the estimated regression results of GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income on cash reserve ratio.

Table 5

Estimated regression results of GDP growth rate, money supply, bank rate, inflation, remittance, and per capita income on cash reserve ratio

The results are based on panel data of 10 Nepalese commercial banks with 100 observations for the period of 2013/14 to 2022/23 by using the linear regression model and the model is $CRR = \alpha + \beta_1 GDP_{it} + \beta_2 MS_{it} + \beta_3 BR_{it} + \beta_4 I_{it} + \beta_5 R_{it} + \beta_6 PCI_{it} + e_{it}$ where, the dependent variable is CRR (Cash reserve

ratio is measured by the percentage of cash required to be kept in reserves as against the bank's total deposits, in percentage). The independent variables are GDP (Gross domestic product as measured by real gross domestic product, in percentage), MS (Money supply as measured by broad money supply in the economy in a year, in percentage), BR (Bank rate is defined as the rate of interest which is charged by a central bank while lending loans to a commercial banks, in percentage), INF (Inflation rate is measured by rate of inflation in a particular year, in percentage), R (Remittance is measured as remittances received by households from international migrants, Rs. in billion) and PCI (Per capita income as measured by the amount of money earned per person in a nation or geographic region, Rs. in billion).

| Model | Intercept | Regression coefficients of | | | | | | Adj. R_bar² | SEE | F-value |
		PCI	MS	BR	R	GDP	INF			
1	21.059 (0.635)	1.591 (0.146)						0.029	8.739	0.021
2	16.246 (1.116)		0.001 (0.002)					0.010	8.740	3.876
3	18.062 (3.294)**			-0.267 (0.341)				0.009	8.735	0.116
4	22.024 (0.718)				2.013 (0.189)			0.009	8.738	0.036
5	16.898 (11.334)**					0.153 (0.563)		0.007	8.726	0.317
6	16.508 (5.875)**						-0.048 (0.109)	0.010	8.739	0.012
7	71.117 (0.821)	31.448 (0.643)	11.467 (0.626)					0.016	8.766	0.206
8	68.826 (0.784)	28.736 (0.564)	10.139 (0.519)	-0.179 (0.203)				0.026	8.810	0.150
9	105.640 (1.088)	6.877 (0.121)	13.341 (0.671)	-1.177 (0.825)	37.399 (0.889)			0.029	8.819	0.310
10	97.222 (0.636)	1.863 (0.020)	11.668 (0.379)	-1.149 (0.776)	37.714 (0.887)	0.038 (0.072)		0.039	8.866	0.246
11	183.486 (1.040)	47.749 (0.470)	22.356 (0.685)	0.388 (0.180)	32.734 (0.765)	0.433 (0.652)	-1.289 (0.979)	0.040	8.868	0.365

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. Cash reserve ratio is the dependent variable.

Table 5 shows that the beta coefficients for per capita income are positive with cash reserve ratio. It indicates that per capita income has a positive impact on cash reserve ratio. This finding is consistent with the findings of Naceur and Goaied (2010). Similarly, the beta coefficients for money supply are positive with cash reserve ratio. It indicates that money supply has a positive impact on cash reserve ratio. This finding is consistent with the findings of Lastrapes and McMillin (2004). Likewise, the beta coefficients for bank rate are negative with cash reserve ratio. It indicates that bank rate has a negative impact on cash reserve ratio. This finding is similar to the findings of Molyneux *et al.* (2018). Further, the beta coefficients for remittance are positive with cash reserve ratio. It indicates that remittance has a positive impact on cash reserve ratio. This finding is consistent with the findings of Shazad *et al.* (2014). In addition, the beta coefficients for GDP growth rate are positive with cash reserve ratio. It indicates that GDP growth rate has a positive impact on cash reserve ratio. This finding is similar to the findings of Bunda and Desquilbet (2008). Moreover, the beta coefficients for inflation are negative with cash reserve ratio. It indicates that inflation has a negative impact on cash reserve ratio. This finding is consistent with the findings of Hakimi

and Zagdoudi (2017).

4. Summary and conclusion

The banking industry is the most crucial part of the financial and economic system. It plays a critical role in economic growth at firm, industry and macroeconomic levels. Banks are financial institutions that play intermediary role in the economy through channeling financial resources from surplus economic units to deficit economic units. In turn, they facilitate the saving and capital formation in the economy. Banking system plays an important role in the development of a country's economy and its financial stability. Banks have a very important function to play in the economic operations of any country as financial intermediary. Banks render services such as resource mobilization and allocation, financial intermediation and facilitation of foreign exchange transactions to enhance international trade. The task of providing funds to the economy makes their performance an important objective of any country. Banks are vital to economic growth because the overall financial systems of most economies in the world are influenced by the banking system. As financial intermediaries, bank plays a crucial role in the operation of the economy. Banks insolvencies can result in systematic crisis. Failure of individual banks adversely affects the economy and the society at large.

This study attempts to analyze the impact of economic growth on bank liquidity: A case of Nepal. The study is based on secondary data of 10 commercial banks with 100 observations for the period from 2013/14 to 2022/23.

The major conclusion of the study is that GDP growth rate, money supply, remittance, and per capita income have positive impact on return on assets and cash reserve ratio. It indicates that higher the GDP growth rate, money supply, remittance and per capita income, higher would be the return on assets and cash reserve ratio. However, inflation and bank rate have negative impact on return on assets and cash reserve ratio. It indicates that higher the inflation and bank rate, lower would be the return on assets and cash reserve ratio. Likewise, the study also concluded that per capita income followed by remittance is the most influencing factor that explains the changes in return on assets. Similarly, the study also concluded that remittance followed by per capita income is the most influencing factor that explains the changes in cash reserve ratio.

References

Abbas, F., and S. Ali, and M. Ahmad, 2023. Does economic growth affect the relationship between banks' capital, liquidity and profitability: empirical evidence from emerging economies? *Journal of Economic and Administrative Sciences* 39(2), 366-381.

Ahamed, F., 2021. Determinants of liquidity risk in the commercial banks Bangladesh. *European Journal of Business and Management Research* 6(1), 164-169.

Ali, A., and U. Ahamd, 2023. Liquidity creation and its impact on economic growth: Moderating role of firm size. *Audit and Accounting Review* 3(2), 46-68.

Al-Tamimi, K. A. M., and S. F. Obeidat, 2013. Determinants of capital adequacy in commercial banks of Jordan and empirical study. *International Journal of Academic Research in Economics and Management Sciences* 2(4), 44-58.

Athanasoglou, P. P., M. D. Delis, and C. K. Staikouras, 2006. Determinants of bank profitability in the south eastern European region. *Journal of Financial Decision Making* 2(5), 1-17

Aulia, N. P., and E. N. Aisyah, 2023. Analysis of the influence of financing, inflation, and the amount of money supply on the profitability of Syariah bank in Indonesia: *Islamic Banking and Finance Journal* 7(2), 278-292.

Ayuso, J., D. Perez, and J. Saurina, 2004. Are capital buffers pro-cyclical? Evidence from Spanish panel data. *Journal of financial intermediation* 13(2), 249-264.

Basarda, R. F., M. Moeljadi, and N. K. Indrawati, 2018. Macro and micro determinants of stock return companies in LQ-45 Index. *Jurnal Keuangan Dan Perbankan* 22(2), 310-320.

Batsinda, G., and J. Shukla, 2019. Inflation and profitability of commercial banks in Rwanda: A case study of bank of Kigali. *International Journal of Business and Management* 14(10), 35-43.

Beck, T., R. Döttling, T. Lambert, and M. Van Dijk, 2023. Liquidity creation, investment, and growth. *Journal of Economic Growth* 28(2), 297-336.

Berger, P. G., 1995. Diversification's effect on firm value. *Journal of Financial Economics* 37(1), 39-65.

Bialas, M. and A. Solek, 2010. Evolution of capital adequacy ratio. *Economics and Sociology* 3(2), 48-57.

Bunda, I., and J. B. Desquilbet, 2008. The bank liquidity smile across exchange rate regimes. *International Economic Journal* 22(3), 361-386.

Chagwiza, W., 2011. Zimbabwean commercial banks' liquidity and its determinants. *International Journal of Empirical Finance* 2(2), 52-64.

Dhungana, B. R., 2024. Liquidity crunches in the banking industry of Nepal. *Journal of Multidisciplinary Research* 3(1), 17-36.

Distinguin, I., C. Roulet, A. Tarazi, 2013. Bank regulatory capital and liquidity: Evidence from US and European publicly traded banks. *Journal of Banking and Finance* 37(9), 3295-3317.

Fidrmuc, J., Z. Fungáčová, and L. Weill, 2015. Does bank liquidity creation contribute to economic growth? Evidence from Russia. *Open Economies Review* 26(1), 479-496.

Francis, M. E., 2007. Determinants of commercial bank profitability in Sub-Saharan Africa. *International Journal of Economics and Finance* 5(9), 134-143.

Fromentin, V., 2017. The long-run and short-run impacts of remittances on financial development in developing countries, the quarterly *Review of Economics and Finance* 66(1), 192-201.

Gautam, K. R., 2020. Financial performance analysis of Nepalese financial institutions in the framework of CAMEL. *Journal of Interdisciplinary Studies* 9(1), 56-74.

Gnawali, A., 2018. Non-performing asset and its effects on profitability of Nepalese commercial banks. *International Journal of Research in Business Studies and Management* 5(9), 39-47.

Gropp, R., and F. Heider, 2010. The determinants of bank capital structure. *Review of Finance* 14(4), 587-622.

Hakimi, A., and K. Zaghdoudi, 2017. Liquidity risk and bank performance: An empirical test for Tunisian banks. *Business and Economic Research* 7(1), 46-57.

Hoque, M. A., A. Ahmad, M. M. Chowdhury, and M. Shahidullah, 2020. Impact of monetary policy on bank's profitability: A study on listed commercial banks in Bangladesh. *International Journal of Accounting and Finance Review* 5(2), 72-79.

Igoni, S. U. O. Y. E., J. U. J. Onwumere, and L. U. C. K. Y. Orlu, 2020. Nexus of monetary policy and per capita income in the Nigerian economy: is the development sustainable. *IOSR Journal of*

Economics and Finance 11(2), 42-47.

Ismail, I., O. I. Bacha, and M. M. Mantai, 2024. Impact of liquidity creation on real economic output: evidence from full-fledged Islamic banks and hybrid conventional banks. *Journal of Islamic Monetary Economics and Finance* 10(2), 397-426.

Jamal, A. A. A., M. Hamidi, and M. R. A. Karim, 2012. Determinants of commercial banks' return on asset: panel evidence from Malaysia. *International Journal of Commerce, Business and Management* 1(3), 55-62.

Kanwal, S., and M. Nadeem, 2013. The impact of macroeconomic variables on the profitability of listed commercial banks in Pakistan. European *journal of business and social sciences* 2(9), 186-201.

Lastrapes, W. D., and W. D. McMillin, 2004. Financial sector influences on aggregate money demand. *Journal of Money Credit and Banking* 36(1), 209-223.

Matres, J. D. O. G., and T. V. Le, 2021. The impact of money supply on the economy: A Panel Study on Selected Countries. *Journal of Economic Science Research* 4(4), 48-53.

Meyer, D., & Shera, A. (2017). The impact of remittances on economic growth: An econometric model. *Economia* 18(2), 147-155.

Milic, D., and D. Solesa, 2017. The analysis of macroeconomic determinants of the banking sector liquidity with role in financing agricultural sector. *Economics of Agriculture* 64(2), 533-550.

Molyneux, P., A. Reghezza, and R. Xie, 2019. Bank margins and profits in a world of negative rates. *Journal of Banking and Finance* 107, 105613.

Moussa, M. A., 2023. The impact of economic growth on bank liquidity: Case of Tunisia. *Journal of Banking and Finance Management* 4(1), 2642-9144.

Musah, A., F. K. Anokye, and E. D. Gakpetor, 2018. The impact of interest rate spread on bank profitability in Ghana. *European Journal of Business, Economics and Accountancy* 6(1), 27-39.

Naceur, S. B., and M. Goaied, 2010. The determinants of commercial bank interest margin and profitability: Evidence from Tunisia. *Frontiers in Finance and Economics* 7(1), 106-130.

Nier, E., and U. Baumann, 2006. Market discipline, disclosure and moral hazard in banking. *Journal of Financial Intermediation* 15(3), 332-361.

Nzotta, S. M., 2009. Financial deepening and economic development of Nigeria: An empirical investigation. *African Journal of Accounting, Economics, Finance and Banking Research* 5(5), 1-15.

Obinna, O., 2022. Financial deepening and per capita income in Nigeria: An impact assessment. *Journal of Management Sciences Research* 2(1), 253-261.

Ogubunka, U. M., 2003. Walking ahead of bank distress. The secrets of safeguarding your money in banks, Lagos. *Rhema Enterprises* 2(1), 19-26.

Poudel, S. R., 2018. Impact of credit risk on profitability of commercial banks in Nepal. *Journal of Applied and Advanced Research* 3(6), 161-170.

Pradhan, R. S., and B. Bam, 2016. Influence of bank-specific and macroeconomic variables on credit risk: A case of Nepalese commercial banks. *E-Journal SSRN* 2(1), 1-16.

Pradhan, R. S., and D. Shrestha, 2017. Impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. *Electronic Journal* 1(1), 1-14.

Prasanto, O., D. Wulandari, B. S. Narmaditya, and M. Kamaludin, 2020. Determinants of bank profitability: New evidence from state-owned banks in Indonesia. *Trikonomika* 19(1), 29-35.

Qureshi, M. J., and D. A. Siddiqui, 2020. The effect of intangible assets on financial performance, financial policies, and market value of technology firms: a global comparative analysis. *Asian Journal of Finance and Accounting* 12(1), 26-57.

Ruziqa, A., 2013. The impact of credit and liquidity risk on bank financial performance: the case of Indonesian Conventional Bank with total asset above 10 trillion Rupiah. *International Journal of Economic Policy in Emerging Economies* 6(2), 93-106.

Sathyamoorthi, C. R., M. Mapharing, and M. Dzimiri, 2020. Liquidity management and financial performance: Evidence from commercial banks in Botswana. *International Journal of Financial Research* 11(5), 399-413.

Scheiber, T., M. Silgoner, and C. Stern, 2016. The development of bank profitability in Denmark, Sweden and Switzerland during a period of ultra-low and negative interest rates. *European Economic Integration* 11(3), 8-28.

Shahzad, S. J. H., N. Adnan, S. Ali, and N. Raza, 2014. Impact of remittances on financial development in South Asia. *Review of Economics and Business Studies* 7(2), 11-29.

Sufian, F., and R. R. Chong, 2008. Determinants of bank profitability in a developing country: Empirical evidence from the Philippines. *Asian Academy of Management Journal of Accounting and Finance* 4(2), 91-112.

Sutradhar, S. R., 2020. The impact of remittances on economic growth in Bangladesh, India, Pakistan and Sri Lanka. *International Journal of Economic Policy Studies* 14(1), 275-295.

Trenca, I., N. Petria, and E. A Corovei, 2015. Impact of macroeconomic variables upon the banking system liquidity. *Procedia Economics and Finance* 32(2), 1170-1177.

Wum, H. L., C. H. Chen, and F. Y. Shiu, 2007. The impact of financial development and bank characteristics on the operational performance of commercial banks in the Chinese transitional economy. *Journal of Economic Studies* 34(5), 401-414.

Zribi, N., and B. Younes, 2011. The factors influencing bank credit risk: The case of Tunisia. *Journal of Accounting and Taxation* 3(4), 70-78.