



Firm-Specific Determinants of Liquidity in Nepalese Commercial Banks



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ARTICLE INFO

Received data: Dec.10, 2024

Reviewed: Dec.25, 2024

Revised: Dec. 30, 2024

Accepted: Jan.1, 2025

ABSTRACT

Purpose - This study examines the determinants influencing liquidity in Nepalese commercial banks. This study analyzes the impact of firm-specific variables on the liquidity of Nepalese commercial banks covering the period from 2010/11 to 2022/23. **Design/Methodology/Approach** - The study employs a judgmental sampling technique to pick six commercial banks from a total of twenty in Nepal: Nabil Bank Limited, Standard Chartered Bank Limited, Global IME Bank Limited, NIC Asia Bank Limited, Rastriya Banijya Bank Limited, and Agricultural Development Bank Limited. Using a descriptive, correlation, and explanatory research design to look into the connection between the liquidity ratio, which measures liquid assets compared to total assets, and key firm-specific variables such as capital adequacy ratio, total loan-to-total-assets ratio, interest rate margin, deposits, and non-performing loans. Also, used the generalized method of moments (GMM) estimation of dynamic panel data from six commercial banks (from 2010/11 to 2022/23) and analyzed data spanning 13 years to identify significant patterns. **Findings**- The findings reveal that the capital adequacy ratio, deposit ratio, and net interest margin positively and significantly influence liquidity. Conversely, the total loan-to-total assets ratio and non-performing loans exhibit a strong negative relationship with liquidity. **Originality/Value**- This study contributes to the existing literature by offering new empirical evidence on firm-specific determinants of liquidity. It provides practical guidance for improving liquidity management in Nepalese commercial banks. The insights are crucial for designing robust banking policies and strategies to ensure financial stability and operational efficiency in the banking sector.

Keywords

Liquidity risk management, capital adequacy standards, liquidity determinants, non-performing loans, Nepalese commercial banks.

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Introduction

Liquidity is a vital metric of a bank's financial stability, signifying its capacity to fulfill short-term liabilities without sustaining significant losses. Aspachs et al. (2005) emphasized that a bank's liquidity refers to

its ability to employ liquid assets to meet expected obligations, such as financing loans or repaying debts, under diverse situations. The Bank for International Settlements (BIS, 2008) similarly underscores that liquidity signifies a bank's capacity to fund asset

expansion and fulfill obligations in a timely manner. Effective liquidity management requires banks to maintain a sufficient balance of liquid assets to fulfill consumer needs while ensuring their financial stability. The fundamental problem for banks is to attain an optimal liquidity level that reconciles profitability with risk. Non-performing loans, as noted by Louzis et al. (2011), substantially exacerbate liquidity challenges, whilst Boudriga et al. (2009) contend that the resolution of these loans continues to be a pressing issue for regulators worldwide. Furthermore, liquidity gaps and risks are intensified by banks' maturity transformation function, which involves converting short-term deposits into long-term loans, resulting in a possible mismatch (Malik & Rafique, 2013).

Liquidity not only secures financial institutions but also shields the wider financial system from systemic hazards. Adebayo et al. (2011) and Arif and Anees (2012) emphasized the interrelationship among liquidity, profitability, and operational efficiency in banking institutions. Gautam (2016) identified key determinants of liquidity in Nepalese commercial banks, including capital adequacy, non-performing loans, profitability, and economic indicators such as GDP growth and inflation. The Nepalese banking sector, marked by restricted financial diversification and poor financial inclusion, has often encountered liquidity issues. Nepal Rastra Bank's (NRB) efforts to improve liquidity management and the slow but steady rollout of digital banking and new financial

services have been made to ease these problems (Bank and Financial Institution Act, 2017). Ali and Jameel (2019) underscored the significance of liquidity in sustaining trust and confidence among depositors and investors in banks. Thus, the ability to fulfill obligations on time affects both financial stability and the bank's reputation and competitive standing in the market. Adhikari (2020) emphasized that comprehending the factors influencing liquidity is crucial for efficient management, particularly in developing economies, such as Nepal, where commercial banks are integral to economic advancement.

Nepalese commercial banks, essential to the nation's economic development, encounter persistent difficulties in effectively managing liquidity. Comprehending the factors influencing liquidity is crucial for maintaining financial stability, reducing systemic risks, and improving operational efficiency inside these institutions. This study aims to examine firm-specific factors that affect the liquidity of Nepalese commercial banks. In addition, previous empirical findings reveal contrasting outcomes regarding the nexus between bank-specific variables and liquidity. Hence, this study specifically intends to examine the nexus between bank-specific (capital adequacy ratio, total loans-to-total assets ratio, interest rate margin, deposits, and non-performing loans) variables and liquidity.

The remaining part of this study is organized as follows: The second section is devoted to a literature review and hypothesis formulation. The third section describes the data, variables, and method used. The fourth section presents

the results and discusses them. The final section concludes with a conclusion.

Literature Review and Hypotheses Development

The funding liquidity theory underscored the importance of cash flows and funding sources in the management of liquidity risk. Diamond and Rajan (2000) stressed how important funding liquidity is for banks and how there may be a difference between assets that are hard to sell and short-term debts. They contend that liquidity risk occurs when liabilities mature prior to the liquidation of the associated assets. This theory emphasized the essential importance of funding liquidity, especially for institutions dependent on short-term financing for long-term illiquid assets. Problems with financing or a drop in market confidence can cause big liquidity problems. For financial stability, it is very important to manage liquidity well. Likewise, the systemic risk theory analyzed liquidity risk from a comprehensive systemic viewpoint, emphasizing its capacity to induce financial instability. Gorton (2010) examined how the interdependence of the financial system and the amplification of liquidity risk contributed to the worldwide financial crises of 2007–2008. Systemic liquidity risk occurs when numerous institutions encounter concurrent funding difficulties, resulting in a contagion effect that may escalate into a pervasive financial catastrophe. This theory underscores the interconnection of financial institutions and the ripple effects of liquidity issues, emphasizing the necessity for coordinated risk management at a systemic level. The

convertibility idea posited by Moulton (1915) asserted that liquidity can be transformed by asset management tactics. The theory promotes the retention of highly liquid assets, such as government bonds, which are characterized by low risk, profitability, and ease of liquidation. Moulton asserts that banks can improve liquidity while maintaining profitability by equilibrating commercial lending with investments in convertible assets. This technique has limits, as a heavy reliance on government bonds may diminish income accumulation due to their low yields. The integration of stock markets and banking systems differs among countries, affecting the relevance of this idea. Notwithstanding these challenges, convertibility theory offers significant insights into liquidity management via asset diversification.

Bunda and Desquilbet (2008) looked into what factors affect liquidity risk in emerging economies. They found that lending interest rates, GDP growth, and capital adequacy all had positive effects on liquidity, while prudential regulation during financial crises had negative effects. Vodova (2011) examined Czech banks and determined that capital adequacy and non-performing loans had a favourable impact on liquidity, but inflation and financial crises adversely affected it. Tesfaye (2012) indicated that, within Ethiopian banks, capital adequacy, interest rates, and bank size positively influence liquidity, but Abdullah and Khan (2012) noted a negative correlation between bank size and liquidity risk in domestic banks. Additionally, Choon et al. (2013) and

Chagwiza (2014) underscored the influence of macroeconomic variables such as GDP and financial crises, with Chagwiza highlighting a distinct correlation between liquidity and Zimbabwe's multi-currency system.

Subsequent investigations validated and enhanced these results. Alshatti (2015) correlated liquidity management with profitability in Jordanian banks, proposing a systematic framework for operational efficiency. Moussa (2015) identified substantial impacts of GDP growth and inflation on liquidity in Tunisia, but Singh and Sharma (2016) noted divergent effects of capital adequacy and bank size in Indian banks. Sheefeni and Nyambe (2016) emphasized the essential function of GDP in liquidity management in Namibia. New studies, like Faisal et al. (2019) and Think et al. (2022), have looked at the connection between capital, liquidity, and profitability. They found that the effects are different depending on where the study was done and the type of institution used. Abbas et al. (2023) emphasized the interrelation of liquidity, capital, and profitability in Asian emerging economies, with economic expansion reinforcing these connections. These data jointly highlight the diverse factors influencing bank liquidity across various countries and timeframes.

The rise of fintech and digital banking has transformed liquidity management practices. Fintech innovations, such as automated payment systems and digital lending platforms, have enhanced banks' ability to manage liquidity efficiently by optimizing

fund utilization and reducing operational delays (Adebayo, David, & Samuel, 2011). Digital banking services, including mobile banking and online transactions, have expanded customer outreach, increasing deposit inflows and improving liquidity. Moreover, advancements in real-time data analytics enable banks to monitor and predict liquidity needs more accurately, allowing for proactive decision-making. A regional perspective highlights similarities and contrasts in liquidity management across South Asian countries. Nepalese commercial banks, for instance, face liquidity challenges due to limited financial inclusion and dependency on remittance inflows. In contrast, Indian banks benefit from a more diversified financial ecosystem, leveraging fintech integration and broader economic scales to maintain liquidity. Similarly, Sri Lankan banks exhibit higher liquidity pressures stemming from economic instability and lower deposit mobilization rates (Malik & Rafique, 2013). Comparative studies underlined that Nepalese banks can learn from regional counterparts by adopting digital banking technologies and regulatory frameworks that enhance liquidity management.

Subedi and Neupane (2013) emphasized that bank-specific factors, including size and capital adequacy, as well as macroeconomic variables like GDP growth and inflation, significantly affect liquidity levels. Ojha (2016) showed that GDP, return on equity (ROE), return on assets (ROA), and non-performing loans are important factors that affect liquidity. This shows how internal and

external factors can affect banks in different ways. Pradhan (2016) investigated the drivers of profitability and discovered that the credit-deposit ratio and liquidity greatly influence the profitability of Nepalese banks. Pokharel et al. (2019) underscored the essential influence of liquidity on profitability, demonstrating variations in liquidity ratios and their intricate association with profitability indicators such as ROA and ROE.

Subsequent research elaborated on these dynamics, investigating the ramifications of liquidity management and structural issues. Bista and Basnet (2020) emphasized the preeminence of internal factors such as capital adequacy and bank size over macroeconomic variables in influencing liquidity. Khati (2020) looked into the relationship between liquidity and profitability in more detail. He found that different liquidity indicators had weak or no relationships with profitability measurements. Budhathoki et al. (2020) emphasized the importance of liquidity and bank size, highlighting their differing effects on ROA, ROE, and net interest margin (NIM). Shrestha and Chaurasiya (2023) recently emphasized liquidity management as a crucial determinant of profitability, noting that specific liquidity ratios considerably affect ROA in Nepal's joint venture commercial banks. These studies collectively emphasize the intricate interrelationships among liquidity, profitability, and macroeconomic variables in influencing the financial performance of commercial banks in Nepal.

Liquid assets to total assets ratio (LQD)

In this study, liquidity has been used as a

dependent variable. Bank liquidity is the ability of a bank to meet its obligations due at any time, especially to repay customer deposits or to make a payment on the client's order (P. K. Vodova 2016). The liquidity ratio is measured as liquid assets to total assets ratio. The LQD liquidity ratio should indicate a bank's overall ability to withstand liquidity shocks. If market liquidity stays the same across all sampled institutions, having a higher percentage of liquid assets compared to total assets usually makes it easier to handle liquidity shocks. While liquid assets yield minimal income and entail significant opportunity costs for the bank, a high value for this ratio may be considered inefficient. Therefore, optimizing the interplay between liquidity and profitability is essential.

Capital adequacy ratio (CAR)

The capital adequacy ratio assesses a bank's capacity to endure economic fluctuations and the volatility of financial institutions. Generally, there exists a positive correlation between bank liquidity and capital (Gul et al., 2011). Bank capital consists of common stock, surplus money, undivided earnings, contingency reserves, and other capital reserves. This study uses the total capital-to-total risk-weighted assets ratio as a proxy for the capital adequacy ratio.

H1: Capital adequacy ratio positively and significantly impacts liquidity in Nepalese commercial banks.

Total loan to total assets ratio (TLTAR)

The total loan-to-total-assets ratio represents the proportion of total loans relative to total assets. An elevated total loan-to-total-asset

ratio may result in liquidity issues, heightened funding costs, and regulatory challenges. In contrast, a diminished ratio improves a bank's liquidity management, mitigates financial risk, and ensures superior adherence to regulatory mandates. Commercial banks must meticulously regulate this ratio to reconcile the need for lucrative lending with the imperative of maintaining adequate liquidity to fulfill short-term liabilities and guarantee overall financial stability. Moussa (2015) discovered that the total loan-to-total-assets ratio significantly affects bank liquidity. This study utilizes the ratio of total loans to total assets as a proxy for the total loan-to-total-assets ratio.

H2: Total loan to total assets ratio negatively and significantly impact on the liquidity in Nepalese commercial banks.

Interest rate margin (IRM)

When banks and other financial institutions earn interest, they pay interest to their lenders, like on deposits. The net interest margin (NIM) is the difference between this and the total amount of interest-earning assets they have. NIM quantifies the effectiveness of financial intermediation (Hamadi and Awdeh, 2012). The notion of net interest margin parallels that of net interest spread; however, it represents the nominal average differential between borrowing and lending rates, disregarding the potential variance in instruments and volumes of earning assets and borrowed money. Anthony (2012) illustrated the positive and substantial correlation between interest rate margin and liquidity. Nigerian bank liquidity rises with

an increase in the interest rate spread.

H3: Interest rate margin ratio positively and significantly impact on the liquidity in Nepalese commercial banks.

Deposits (DEP)

Calculated the deposit ratio by dividing the total of all client deposits by the total assets. A decrease in the proportion of deposits relative to total assets increases the expense of borrowed capital, and elevated costs diminish bank profitability. Bank deposits are an attractive means of supporting a bank due to their lower interest rates compared to bonds or bank loans. A declining bank deposit ratio increases the expense of bank debt and diminishes current profitability. This study incorporate profit into the computation to address this effect. The proportion of total deposits to total assets adversely affects the liquidity risk of commercial banks (Leykun 2016).

H4: Deposit ratio positively and significantly impact on the liquidity in Nepalese commercial banks.

Non-performing loan (NPL)

The classification of a loan as non-performing if the borrower fails to make interest payments or return any principal. McNulty et al. (2001) assert that managing nonperforming loans is essential for the economic financial landscape and the efficacy of individual institutions. Substantial non-performing loans could erode the confidence of international investors and depositors in the bank, perhaps resulting in a bank run and subsequent liquidity challenges. Thus, the volume of non-performing loans adversely affects the liquidity of banks. The

ratio of nonperforming loans to total loans acts as a proxy for the nonperforming loan ratio in this analysis.

H5: *Non-performing loan negatively and significantly impact on the liquidity in*

Table 1

Summary of variables and their expected relatives

Variables	Measurement/proxies	Notation	Expected effect	Previous studies
Liquidity	Liquidity assets/total assets	LQD		Vodova (2016)
Capital adequacy ratio	Total capital/total risky weighted assets	CAR	+	Gul et al. (2011)
Total loan to total assets ratio	Total loan/total assets	TITAR	-	Moussa (2015)
Interest rate margin	Interest earned from loan/total loan and advanced – interest paid on deposit/customer’s deposits	IRM	+	Anthony (2012)
Deposits ratio	Total deposit/total assets	DEP	+	Leykun (2016)
Non-performing loan	Nonperforming loan/total loans	NPL	-	McNulty et al. (2001)

Prior research has thoroughly examined factors including financial performance, liquidity risk, profitability determinants, and loan quality in the commercial banking industry. Research on parameters like capital adequacy ratio, total loan-to-assets ratio, interest rate margin, deposits, and non-performing loans in Nepal is scarce. Despite partial analysis of these variables, the overall impact on liquidity in Nepalese commercial banks has not received enough attention. Also, most of the earlier studies were done before Nepal Rastra Bank's regulatory changes in the middle of 2015, which meant that capital funds had to be increased to eight billion Nepalese rupees by 2017. Previous analyses have not taken into account the impact of this regulatory change on bank liquidity. This study fills these gaps by utilizing current data and employing panel data regression methods to analyze firm-specific factors influencing liquidity in Nepal's commercial banks.

Nepalese commercial banks.

The variables, their measurements, notation, expected effect, and their similarities in previous studies are presented in Table 1.

Data, Variables and Methods

The study used both descriptive statistics and econometric tools to analyze the data. The former one includes simple descriptive methods such as, mean, maximum; minimum, standard deviation and others that enable to better understand the existing situation and analyze the general trends of the data using correlation, regression, multicollinearity and generalized method of moments (GMM). The study used descriptive and causal-comparative research approach to examine the factors affecting the liquidity of commercial banks in Nepal from the fiscal year 2010/11 to 2022/23. Descriptive research characterizes cross-sectional liquidity management trends in Nepalese banks, emphasizing factors such as the capital adequacy ratio (CAR), the total loan-to-total assets ratio (TLTAR), deposits, interest rate margins (IRM), and non-performing loans (NPL). By applying causal-comparative research to examine cause-and-

effect correlations between liquidity and these variables. The research integrates descriptive statistics and regression analysis to discern trends, correlations, and the influence of independent variables on liquidity. Twenty commercial banks in Nepal make up the study's population, and the sample was selected using a non-probability purposive sampling method. The strategy was to ensure the representation of diverse ownership structures and operational attributes in the banking sector. By choosing the six banks, representing 30% of the overall population, based on defined criteria. Two joint venture banks, Nabil Bank Limited and Standard Chartered Bank Limited, were included to exemplify institutions with international involvement, which frequently provide distinctive management practices and strategies. Rastriya Banijya Bank Limited and Agricultural Development Bank Limited were chosen as examples of state-owned banks that have a lot of public sector involvement to show how government-controlled institutions work. Furthermore, two merged banks (Global IME Bank Limited and NIC Asia Bank Limited) were selected to analyze the liquidity characteristics of institutions formed through mergers, as these entities often have distinct obstacles to asset and liability consolidation. This sampling method to provide a comprehensive understanding of liquidity issues, taking into account the diversity within Nepal's commercial banking industry. The research employs 13 years of data from each bank, resulting in a total of 78 observations. The data are derived from bank supervision reports issued by the

Nepal Rastra Bank (NRB), yearly reports of selected banks, and additional financial figures supplied by official and regulatory entities. This secondary data concentrates on both dependent and independent variables. The dependent variable, liquidity, is defined as the ratio of liquid assets to total assets, whereas the independent variables are CAR, TLTA, IRM, deposits, and NPL.

The data analysis encompasses both descriptive and regression methodologies. Descriptive statistics offer insights into temporal trends and variability, utilizing metrics such as means, standard deviations, minimums, and maximums to encapsulate data distributions. Regression analysis investigates the correlations between liquidity and the independent variables. By employing a panel data model and regression the dependent variable (liquidity) against the independent factors using the following equation:

$$LQD_{it} = \alpha + \beta_1 + CAR_{it} + \beta_2 TLTA_{it} + \beta_3 IRM_{it} + \beta_4 + DEP_{it} + \beta_5 + NPL_{it} + \varepsilon \dots (i)$$

Where,

LQD_{it} stands for liquidity, defined as the ratio of liquid assets to total assets at time period t (in percentage)

CAR_{it} stands for capital adequacy ratio of bank, defined as the sum of tier I and tier II capital divided by total risk weighted exposures at time period t (in percentage)

$TLTA_{it}$ stands for total loan to total assets ratio of the bank, defined as the ratio of total loan to total assets at period t (in percentage)

IRM_{it} stands for interest rate margin of bank,

defined as the difference between the average interest rate earned on interest-earning assets (loans) and the average interest rate paid on deposits (from savers) at time t (in percentage)

DEP_{it} stands for deposit from the customer of a bank, defined as the ratio of total deposit to total assets at time t (in percentage)

NPL_{it} stands for the non-performing loan of a bank, defined as the ratio of non-performing loan to total loan at time t (in percentage)

ε is the error term, α is the intercept of dependent variables and $\beta_1, \beta_2, \beta_3, \beta_4,$ and β_5 are the beta coefficients of the explanatory variables to be estimated.

The research expands upon previous studies by integrating variables such as NPL and IRM, as utilized in the works of Ojha (2016) and Thinh et al. (2022). This method improves

the research by offering a more thorough comprehension of the factors influencing liquidity in commercial banks. Utilizing powerful statistical tools such as EViews guarantees precise analysis and dependable outcomes, allowing policymakers and decision-makers to discern essential aspects affecting bank liquidity and formulate effective solutions.

Result and Discussion

The research examines bank liquidity and its drivers through descriptive statistics, encompassing mean, standard deviation, minimum, and maximum values, derived from 78 observations across six commercial banks over a period of 13 years (2010/11–2022/23).

Table 2
Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
LQD	78	5.24	39.02	14.21	6.83
CAR	78	(-22.52)	23.68	13.22	5.96
TLTAR	78	40.22	73.87	62.20	8.90
DEP	78	58.06	91.01	82.14	6.20
IRM	78	3.35	12.11	7.09	1.94
NPL	78	0.01	10.90	2.23	2.10

LQD denotes liquidity ratio, CAR represents capital adequacy ratio, and TLTAR denotes total loans to total assets ratio. DEP stands for deposits to assets ratio. IRM denotes the interest rate margin of the banks. NPL stands for nonperforming loans. Source: Own computation.

Table 2 displays the comprehensive descriptive statistics, encompassing the lowest, maximum, mean, and standard deviation of LQD and other chosen independent variables. Liquidity (LQD), the dependent

variable, ranges from 5.24% to 39.02%, with a mean of 14.21% and a standard deviation of 6.83%, signifying considerable variability. The capital adequacy ratio (CAR) among the independent variables varies from -22.52%

to 23.68%, with a mean of 13.22% and a standard deviation of 5.96%. The total loan to total assets ratio (TLTAR) demonstrates significant variety, spanning from 40.22% to 73.87%, with a mean of 62.20% and a standard deviation of 8.90%. Deposits (DEP) vary from 58.06% to 91.01%, with a mean of 82.14% and a standard deviation of 6.20%. The interest rate margin (IRM), the least variable element, spans from 3.35% to 12.11%, with a mean of 7.09% and a standard deviation of 1.94%. Non-performing loans

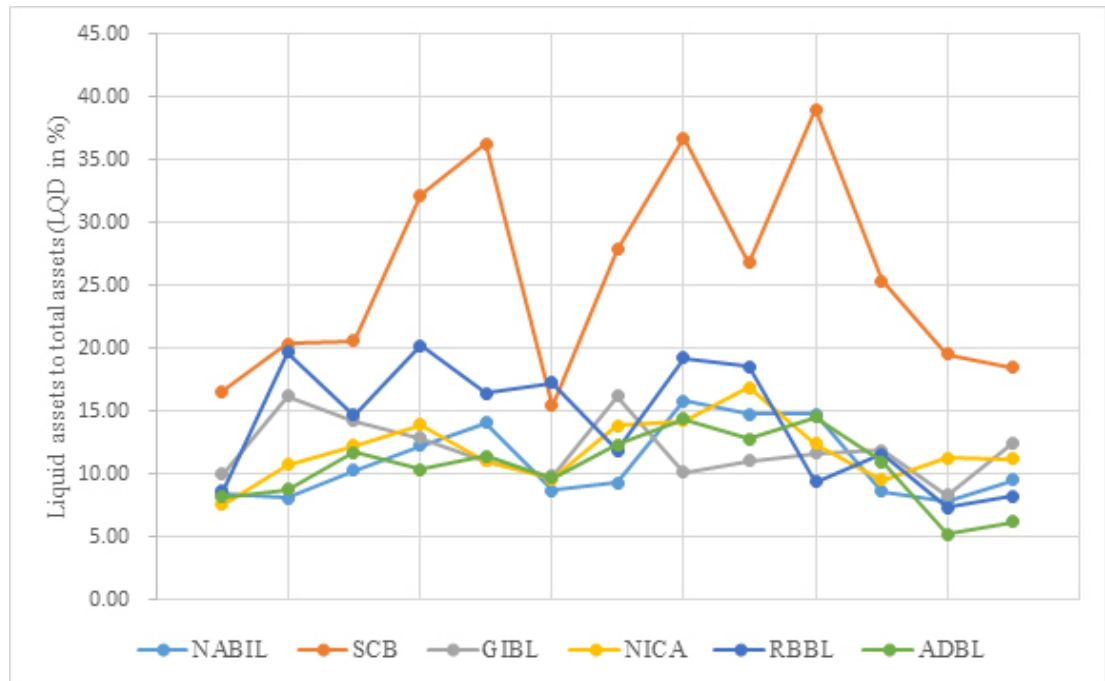
(NPL) range from 0.01% to 10.90%, with an average of 2.23% and a standard deviation of 2.10%. These statistics offer essential insights into trends and variability in liquidity and its drivers within Nepalese commercial banks.

Graphical Representation

For the fulfillment of the objective of the study, to examine the trend of determinants of liquidity in sampled commercial banks, the graphical representation of liquidity is used as below:

Figure 1

Graphical Representation of Liquidity



The graph shows the liquid assets to total assets ratio (LQD) for six banks over time, highlighting differences in liquidity management. SCB exhibits the highest peaks and volatility, with its LQD ratio exceeding 35% at times, indicating dynamic liquidity

management. In contrast, NABIL shows moderate fluctuations, while GIBL, NICA, RBBL, and ADBL maintain stable and lower LQD ratios, reflecting steady and consistent liquidity strategies.

Table 3

Regression Results of Liquidity

Dependent variable: Liquid assets to total assets (LQD)	(1) Fixed effect	(2) Random effect
Capital adequacy ratio (CAR)	0.31** (0.135)	0.40*** (0.119)
Total Loan to Total Assets Ratio (TLTAR)	-0.32** (0.130)	-0.56*** (0.077)
Deposits (DEP)	0.26** (0.117)	0.19* (0.103)
Interest rate margin (IRM)	-0.43 (0.422)	-0.14 (0.382)
Non-performing loan (NPL)	0.30 (0.519)	-0.70** (0.341)
No. of observations	78	78
R-Squared	0.6690	0.5734
Adjusted R-Squared	0.6196	0.5438
F-Statistic	13.5435	19.3543
Prob (F-Statistic)	0.0000	0.0000

*LQD denotes liquidity ratio, CAR represents capital adequacy ratio, and TLTAR denotes total loans to total assets ratio. DEP stands for deposits to assets ratio. IRM denotes the interest rate margin of the banks. NPL stands for nonperforming loans. * for a 10% level of significance, ** for a 5% level of significance, and *** for 1% level of significant. The figure in parentheses indicates standard error. Source: Own computation.*

Table 3 presents the regression results that analyze the impact of firm-specific determinants—capital adequacy ratio (CAR), total loan to total assets ratio (TLTAR), deposits (DEP), interest rate margin (IRM), and non-performing loans (NPL)—on the liquidity of Nepalese commercial banks, measured as liquid assets to total assets (LQD). The fixed effects model shows that there are statistically significant positive relationships between LQD and CAR (0.31) and DEP (0.26). This means that banks' liquidity improves when they have enough capital and more deposits.

Conversely, TLTAR (-0.32) demonstrates a significant negative relationship with LQD, suggesting that a higher proportion of loans to total assets diminishes liquidity. This is likely because loan portfolios tie up funds in less liquid assets, highlighting the trade-off between profitability and liquidity. The model explains 67% of the variance in LQD, with an adjusted R-squared value of 0.6196, showcasing its strong explanatory power.

This paper observed similar trends in the random effects model. CAR (0.40) and DEP

(0.19) both have strong positive relationships with liquidity. This shows how important it is to have strong capital reserves and steady deposit flows to keep the economy stable. However, the random effects model also identifies significant negative correlations for both TLAR (-0.56) and NPL (-0.70). The inclusion of NPL as a significant factor in this model underscores its detrimental impact

on liquidity, as non-performing loans reduce a bank's ability to generate returns and fulfill obligations. This model accounts for 57% of the variance in LQD, with an adjusted R-squared value of 0.5438, which, although slightly lower than the fixed effects model, still provides meaningful insights into the determinants of liquidity.

Table 4

Multicollinearity (VIF)

Variables	VIF	1/VIF
IRM	2.39	0.418330
NPL	2.24	0.447149
CAR	2.19	0.456622
TLAR	2.06	0.484962
DEP	1.77	0.564334
Mean VIF	2.13	

LQD denotes liquidity ratio, CAR represents capital adequacy ratio, and TLAR denotes total loans to total assets ratio. DEP stands for deposits to assets ratio. IRM denotes the interest rate margin of the banks. NPL stands for nonperforming loans. Source: Own computation.

The Variance Inflation Factor (VIF) and its reciprocal (1/VIF) for the independent variables in the regression model were used to find the multicollinearity. The results are shown in Table 4. The Variance Inflation Factor (VIF) gauges the degree to which multicollinearity among the predictors inflates the variance of a regression coefficient. All the variables-IRM (2.39), NPL (2.24), CAR (2.19), TLAR (2.06), and DEP (1.77)-have VIF values below 10, indicating that multicollinearity is not a significant concern. The reciprocal values (1/VIF) range from 0.418 to 0.564, further confirming the absence of severe

multicollinearity. Among the variables, IRM has the highest VIF (2.39), indicating slightly higher multicollinearity compared to the others, while DEP has the lowest VIF (1.77), reflecting the least collinearity. The mean VIF of 2.13 also supports the conclusion that multicollinearity is at acceptable levels, and all variables can be retained in the Table 4 presents the results of the multicollinearity test using the Variance Inflation Factor (VIF) and its reciprocal (1/VIF) for the independent variables in the regression model. The VIF measures the extent to which the variance of a regression coefficient is inflated due to multicollinearity among the predictors.

Table 5

Two-step system GMM estimation result

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	10.58931	13.86454	0.763770	0.4477
CAR	0.311323	0.134797	2.309573	0.0240
TLTAR	-0.315664	0.130407	-2.420611	0.0182
DEP	0.262342	0.116811	2.245865	0.0280
IRM	-0.434479	0.422462	-1.028444	0.3074
NPL	0.299795	0.518833	0.577826	0.5653
R-squared	0.669030			
Adjusted R-squared	0.619631			
F-statistic	13.54351			
Prob. (F-statistic)	0.00000			

*LQD denotes liquidity ratio, CAR represents capital adequacy ratio, TLTAR denotes total loans to total assets ratio. DEP stands for deposits to assets ratio. IRM denotes interest rate margin of the banks. NPL stands for nonperforming loans.*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ implies statistically significant at 1%, 5%, and 10% level respectively. Source: Own computation*

The two-step system GMM estimation results indicate that the CAR has a positive and significant effect on the dependent variable, as evidenced by a coefficient of 0.311 and a p-value of 0.024. Similarly, DEP also exhibit a positive and significant impact, with a coefficient of 0.262 and a p-value of 0.028. In contrast, the TLTAR has a negative and significant influence, with a coefficient of -0.316 and a p-value of 0.0182. However, the other variables, namely IRM and NPL, show no significant effect, with p-values of 0.3074 and 0.5653, respectively. The model demonstrates strong explanatory power, with an R-squared value of 0.669 and an adjusted R-squared of 0.620. Furthermore, the F-statistic is significant ($p = 0.000$), confirming the overall reliability of the

model. This suggests that CAR, TLTAR, and DEP are key determinants of the dependent variable in this analysis.

Visual aids like graphs showing trends in liquidity factors and heat maps showing correlations could be added to the analysis to make it even clearer and more interesting. These tools would provide intuitive representations of the relationships between variables, making the findings more accessible and impactful. The study shows a strong positive connection between liquidity and CAR, which supports what Bunda and Desquilbet (2008), Vodova (2011), Tesfaye (2012), Chagwiza (2014), and Al-Homaidi et al. (2019) already said. The study also reveals a substantial negative correlation between

liquidity and TLAR, aligning with the findings of Shrestha and Chaurasiya (2023). The study identified a notable positive correlation between DEP and liquidity, corroborating the findings of Shrestha and Chaurasiya (2023).

The results support the hypotheses, showing that firm-specific factors such as capital adequacy, deposits, and loan-to-asset ratios have a big effect on liquidity. These results are consistent with prior studies, such as Gautam (2016) and Adhikari (2020), which identified similar determinants in the Nepalese context. What this study does, though, is more in-depth by focussing on the role of bad loans as a major cause of liquidity problems, especially in the random effects model. The implications for banking policies are clear: enhancing capital buffers, improving deposit mobilization, and managing credit risk are essentials for sustainable liquidity management. Furthermore, future studies should include macroeconomic factors like GDP growth and inflation, as these broader economic indicators may give us useful information about how outside forces affect the flow of cash in Nepalese commercial banks.

Conclusion

The primary aim of this study was to analyze the nexus between firm-specific characteristics and the liquidity of commercial banks in Nepal. The results showed strong positive links between the capital adequacy

ratio (CAR), deposits, and liquidity. On the other hand, there was a negative link between liquidity and non-performing loans (NPLs). Based on these results, the study recommends that commercial banks prioritize strengthening their capital adequacy and deposit levels as key strategies to improve liquidity management. Additionally, banks should focus on reducing non-performing loans to ensure sufficient liquidity. The research also emphasizes the importance of transparency in bank operations, enabling customers to make well-informed deposit decisions. The study tells policymakers, especially the Nepal Rastra Bank (NRB), that specific actions and rules should be implemented to deal with liquidity risks. This is especially important since the Nepalese banking sector is still having problems. Strengthening liquidity monitoring frameworks and promoting policies encouraging deposit growth could alleviate some liquidity pressures commercial banks face. This study's scope was limited to five firm-specific determinants of liquidity. In the future, researchers could examine more variables, like return on assets (ROA) and return on equity (ROE), and macroeconomic factors like GDP and inflation, which may also have a big effect on liquidity. Additionally, using bigger sample sizes and a mix of primary and secondary data would give us a fuller picture of how cash flows in Nepalese commercial banks, which would be helpful for both policymakers and practitioners.

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