RELATIONSHIP BETWEEN LIQUIDITY AND PROFITABILITY OF NATIONAL LEVEL DEVELOPMENT BANKS IN NEPAL

A Dissertation submitted to the Office of the Dean, Faculty of Management in partial fulfillment of the requirements for the Master's in Business Studies (MBS)

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CERTIFICATION OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled "Relationship between Liquidity and Profitability of National Level Development Banks in Nepal". The work of this dissertation has not been submitted previously for the purpose of conferral of any degrees nor it has been proposed and presented as part of requirements for any other academic purposes.

The assistance and cooperation that I have received during this research work has been acknowledged. In addition, I declare that all information sources and literature used are cited in the reference section of the dissertation.

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Date:

REPORT OF RESEARCH COMMITTEE

Ms. Sushma Bhattarai has defended research proposal entitled "Relationship between Liquidity and Profitability of National Level Development Banks in Nepal" successfully. The research committee has registered the dissertation for further progress. It is recommended to carry out the work as per suggestions and guidance of supervisor Asso. Prof. Dr. Kapil Khanal and submit the dissertation for evaluation and viva voce examination.

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APPROVAL SHEET

We have examined the dissertation entitled "Relationship between Liquidity and Profitability of National Level Development Banks in Nepal" presented by Sushma Bhattarai for the degree of Master of Business Studies. We hereby certify that the dissertation is acceptable for the award of degree.

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This study entitled "Relationship between Liquidity and Profitability of National Level Development Banks in Nepal" has been prepared in partial fulfillment for the Degree of Master of Business Studies (MBS) under the Faculty of Management, Tribhuvan University is based on research models involving the use of qualitative aspect of impact of credit risk on profitability of commercial banks in Nepal.

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Sushma Bhattarai

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ABBREVIATIONS

ATM	:	Automated Teller Machine
BS	:	Bikram Sambat
CAR	:	Capital Adequacy Ratio
CB	:	Commercial Banks
CRR	:	Cash Reserve Ratio
CV	:	Coefficient of Variation
F/Y	:	Fiscal Year
GDP	:	Gross Domestic Products
IR	:	Interest Rate
JVBs	:	Joint Venture Banks
L & A	:	Loan and Advance
LATA	:	Liquid Assets to Total Assets Ratio
LDR	:	Loan to Deposit Ratio
LSIZE	:	Logarithm of Total Assets
NRB	:	Nepal Rastra Bank
ROA	:	Return on Assets
ROE	:	Return on Equity
SD	:	Standard Deviation
TA	:	Total Assets
TU	:	Tribhuvan University

ABSTRACT

This study aimed to analyze the effect of liquidity on profitability of development banks in Nepal. The study is conducted using panel data of three development banks of Nepal with 30 observations for the period 2012/13 to 2021/22. Descriptive analysis, correlation analysis and ordinary least square regression model are used as a major tool of analysis in this study. It was found that there is strong liquidity position of development banks in form of cash reserve ratio, liquid assets ratio and loan to deposit ratio. The correlation analysis shows that cash reserve ratio has significant positive correlation with ROA and ROE. Similarly, liquid assets to total assets ratio has significant positive correlation with ROA. The correlation analysis also shows that there is significant positive relationship between ROA and loan to deposit ratio (LDR). At the same time, capital adequacy ratio (CAR) has significant negative relation with ROE. Moreover, correlation of bank size has also significant negative relationship with ROA. The multiple regression analyses revealed that cash reserve ratio has significant positive impact on profitability (ROA and ROE) of the banks. At the meantime, liquid assets to total assets ratio has insignificant positive impact on ROA and insignificant negative impact on ROE. However, loan to deposit ratio has significant positive impact on ROA. Moreover, capital adequacy ratio has significant negative impact on ROE of the development banks. Moreover, bank size has insignificant negative impact on profitability of the development banks.

Keywords: *Profitability, Cash Reserve Ratio, Liquid Assets to Total Assets, Loan to Deposit Ratio and Capital Adequacy Ratio.*

CHAPTER - I
INTRODUCTION

1.1 Background of the Study

The term liquidity refers to the banks' short-term availability of cash and cash equivalent assets. The development bank must keep an adequate amount of easily tradable assets at market value with minimal transaction costs. A development bank maintains liquid assets in the form of cash, marketable securities, bank accounts, and other assets that can be quickly converted to cash. However, investing these for a while might provide interest more quickly than keeping a cash balance that is inactive. A development bank must assess the costs and advantages of holding these different liquidity asset balances in order to decide on an optional liquid assets balance. This decision represents the traditional risk-return trade-off that the development bank must make (Abid & Lodhi, 2015). A careful balance between the risk and return components of cash management is necessary for effective cash management (Rudhani & Balaj, 2019).

According to Malik and Rafique (2016), if the development bank does not manage its liquidity well, it could result in low profitability (in the case of high liquidity) or insolvency (in the case of low liquidity), which would ultimately destroy shareholder wealth and cause the financial institution as a whole to fail. As a result, keeping the development bank's liquidity at its ideal level is crucial to its smooth operation and financial success. According to Paul et al. (2021), development banks need to have a clearly defined policy for managing liquidity that is communicated throughout the entire organization. They also need to have a liquidity control strategy that outlines specific guidelines for managing assets and liabilities.

According to Rawal and Thapa (2019), a firm is profitable if it can turn a profit relative to its expenditures and other pertinent expenses during a given time period. Prospective investors focus more on the profitability statistics since they are interested in dividends and stock price appreciation. On the other side, managers are curious to know how to quantify operating success in terms of profitability. As a result, a low profit margin would raise suspicions about incompetent management and discourage potential

investors from funding the business. According to Nourrein and Mennawi (2020), liquidity has a tight link with a business's day-to-day operations, making it a critical component for both internal and external analysts. A business is hazardous and unsound when it has a weak liquidity situation, which also threatens its profitability.

Hence, in order to maintain a desired level of short-term reserve money without impairing the bank's capacity to make a profit or its operations, liquidity management entails the strategic supply, withdrawal from the market, or circulation of that amount of liquidity. It depends on the daily evaluation of the banking system's liquidity circumstances to ascertain its liquidity requirements and, therefore, the amount of liquidity to allocate or remove from the market. The total reserve requirements that a monetary authority imposes on banks determines the liquidity demands of the banking sector (Idowu et al., 2017).

For shareholders, creditors, and the primary tax authorities, liquidity and profitability are critical. It is the desire of businessmen to acquire shares in development banks. Through their investments in development banks, investors can earn, as seen by their return on investment. According to Bhatt and Verghese (2018), liquidity refers to the capacity to meet the needs of customers or depositors for withdrawals, typically on demand or with little warning. Higher liquidity and the premium needed in the future will help development banks lower risk by compensating investors for the costs of doing so. Additionally, they contended that the ideal liquidity level for development banks varies throughout the business cycle, naturally rising when higher expected costs of distress are anticipated. The relationship between profitability and liquidity may also be highly recurring, demonstrating more favorable outcomes throughout the stages of distress as development banks that attempt to strengthen their liquidity position also strengthen their profitability (Dahiyat, 2016). Thus, depending on development banks' current liquidity situation relative to their ideal liquidity level, there may be a negative or positive link between liquidity and profitability in the short term (Vaidya, 2017).

Maintaining a balance between profitability and liquidity is crucial because they are mutually exclusive. This is how profitability and liquidity are traded off. Maximum safety, or to put it simply, liquidity, can only be achieved if development banks maintain sizable reserves of cash or other liquid assets in relation to the deposits they have

retained. However, the development banks will not profit from this if they carry out this action (Zidan, 2020). Therefore, the development bank will have to give up its profitability goal—that is, paying dividends in accordance with the needs of the shareholders—if it chooses to prioritize optimum safety. Conversely, if companies take the opposite approach, that is, simply continue spending and attempting to raise the profitability factor, they will have issues if a consumer requests payment in cash (Budhathoki et al., 2020). Therefore, the development bank must balance the dual goals of making the profitability and liquidity factors work together. This is a very difficult but necessary task.

There are two general classification schemes for development bank liquidity factors. The success of the development bank is influenced by internal factors, which are particular bank characteristics. The internal actions made by the board and management essentially determine these factors (Raut, 2020). The external factors that impact the liquidity of development banks are those that are sector- or nation-wide, outside the company's control (Wuave et al., 2020). The company specifics factors such as assets size (LOGA), capital adequacy (CA), liquidity ratio (LIQ), assets quality (AQ), assets management (AM), profitability (ROA, ROE, NIM), operation efficiency (OPEF), and non-interest income (NII)), and macroeconomic factors such as (economic activity (GDP), inflation rate (IFR), exchange rate (EXCH), and interest rate (INTRT).

The cash balance, bank balance with NRB and other BFIs, money at call and the investment in the government securities are considered as liquid assets of the commercial banks. The total liquid assets of the commercial banks increased in year 2021/22. However, the total liquid assets to deposit ratio decreased in year 2021/22 (Nepal Rastra Bank, 2022).

To prevent any financial service from being disordered, financial institutions must work accurately. The efficient financing activities are closely associated with the optimal amount of liquidity. Due to strong integration, dependencies, and the contagion effect, poorly managed liquidity can result in low profitability in the case of high liquidity or insolvency in the case of low liquidity, which would ultimately destroy shareholder wealth and cause the entire financial institutional framework to collapse. That’s why

this study analyzes the impact of liquidity on profitability of Nepalese development banks.

1.2 Problem Statement

It is argued that liquidity risk kills financial firms. This risk may have a negative impact on capital and earnings for finance companies. The management of a financing firm must therefore make it their top duty to guarantee that there are enough funds available at affordable costs to meet future requests from both providers and borrowers. This assertion is supported by numerous conventional finance company failure stories from the past and present (Abid & Lodhi, 2015). Many finance companies failed, were forced into mergers, or needed resolution even with such broad support. Thereafter, a decline in finance liquidity resulted in serious problems. It is clear that the question of liquidity and liquidity risk is current and significant. As a result, financial firms are anxious to maintain control over their liquidity situation, as do their regulators (Pradhan & Shrestha, 2016).

However, this fragility is also a source of efficiency. Diamond and Rajan (2005) argue that the financial intermediation structure is efficient in that it disciplines banks and other financial institutions when carrying out their lending function. The threat of a run is an incentive for the finance company to choose projects with high return. More generally, this also suggests that an "even more liquid" finance company might not always be desirable for the efficiency of the financial system. Therefore, effective liquidity risk management helps ensure a finance company's ability to meet cash flow obligations, which are uncertain as they are affected by external events and other agents' behavior and to keep their optimal profitability (Pokhrel & Pokhrel, 2019).

Idowu et al. (2017) revealed that there is a statistically significant relationship between banks' liquidity, return on asset and return on equity. However, the relationship is not all that statistically significant when return on asset was used as proxy for profitability. Fagboyo et al. (2018) shown that while an increase in the cash ratio and the liquidity coverage ratio results in a fall in the profitability of the deposit cash banks in Nigeria, an increase in the quick ratio of available funds leads to an increase in profitability.

According to Bhatt and Verghese's (2018) research, return on assets and the liquidity ratio have a negligible positive correlation. The investment ratio and capital ratio with return on assets also have a negligible negative association. Additionally, it is discovered that the net profit margin and the investment and liquidity ratios have a negligible positive correlation. Nonetheless, there is a notable inverse relationship between the capital ratio and the net profit margin. Zidan (2020) found that the ratio of loans to deposits had the greatest significant impact on profitability, while the ratio of capital sufficiency also had a major impact.

Wuave et al. (2020) found that liquidity ratio (LQR) have positive and significant effect on financial performance of DMB as measured by return on assets (ROA), return on equity (ROE) and net interest margin(NIM). While liquidity risk is typically considered to be negligible, Nourrein and Mennawi (2020) stated that credit risk and financial leverage have a considerable and negative impact on the financial performance of Islamic banks in Sudan. Nevertheless, the ratio of liquid assets to total assets indicates that the liquidity risk has a notable and favorable impact on Sudanese banks' financial performance. Paul et al. (2021) found that while LAR and CR proved inconsequential, LDR, DAR, and CDR had a significant impact on profitability as evaluated by ROE. Thus, it can be said that, generally speaking, Bangladesh's commercial banking industry's profitability is greatly impacted by liquidity.

Pokhrel and Pokhrel (2019) looked at how liquidity affected the profitability of Nepalese commercial banks and discovered that while CRR and CBBISD had an adverse correlation with ROA, CRR and IGSCA had a positive correlation. Regarding the liquidity-ROE relationship, the correlation between CR and ROE was inverse, whereas the correlation between the other ratios (CRR, CBBISD, and IGSCA) and ROE was positive. Pradhan and Shrestha (2016) conclude that ROA significantly affects the loan to deposit ratio in a favorable way, while ROE, size, and inflation significantly affect liquidity in a negative way. Similarly, NPL has a positive negligible impact on loan to deposit ratio while CAR and GDP have a negative, insignificant impact. According to the study's findings, size, inflation, ROA, and ROE are important factors that affect bank liquidity.

Simultaneously, Budhathoki et al. (2020) demonstrated that a lower leverage ratio, or higher equity to assets ratio, had a statistically significant beneficial impact on two profitability measures, ROA and NIM, but a statistically insignificant negative relationship with ROE. The final regression model's outcome shows that all three profitability metrics—ROA, ROE, and NIM—were positively impacted by larger bank sizes, which seemed to be advantageous to Nepalese commercial banks. According to Khati (2020), assets quality (AQ) and return on equity (ROE) have a positive and substantial link, while AQ and ROA have a negative and significant relationship. The return on equity (ROE) and return on assets (ROA) have a positive but negligible connection with the cash deposit ratio (CADR). Nonetheless, the research indicates that there is a negative and negligible correlation between credit-deposit (CDR) and return on equity (ROE), and a positive but small correlation between CDR and ROA. Similarly, Kajola et al. (2019) found a positive and statistically significant correlation between return on asset and two proxies for liquidity management (current ratio and liquidity ratio).

Swain and Mishra (2020) stated that the factors affecting liquidity management have a significant impact on the sample banks' profitability. In a similar vein, Saleh et al. (2020) discovered that in order for banks to withstand any future circumstances that could negatively impact their profitability, they need to have more capital and liquidity. On the other hand, the results show some variations in the impact of variables unique to banks and profitability metrics.

The profitability of banks is being negatively impacted by the increasing rivalry among financial institutions, the recent rise in stock market and security transactions, and the taxes imposed on larger bank deposits. Nepal's commercial banks have had limited success directing their capital toward profitable industries. The money in Nepal have not been collected in an appropriate, economical, efficient, and effective media. Thus, in an effort to draw in as many depositors as they can, banks are using the media to advertise various plans. The financial performance of the banks is impacted by inefficiencies and flaws in the financial statement analysis process (Christopoulos et al., 2013).

The bank's liquidity is measured by using the ratio between cash and bank balance and total deposit of the banks, which aids in mitigating the risk of bank's failure in short-term. If the bank lacks sufficient liquidity, then it may fail in paying its depositors and financing its routine payments. Since, regular operation of the bank is affected by liquidity, the performance of the bank also significantly associated with the liquidity of the banks (Kosumi and Kosumi, 2021).

The empirical evidence has demonstrated that a mixed relationship between liquidity risk and profitability of development banks. This study is therefore directed towards establishing the effect of liquidity on the profitability in Nepalese development banks. Specifically, this study is connected to search answer of the following questions related to the selected development banks.

a. What is the position of liquidity (i.e. cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank size) and profitability (i.e. return on assets and return on equity) of Nepalese development banks?
b. What is the relationship between liquidity (i.e. cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank size) and profitability (i.e. return on assets and return on equity) of Nepalese development banks?
c. What is the impact of liquidity (i.e. cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank size) on the profitability (i.e. return on assets and return on equity) of Nepalese development banks?

1.3 Objectives of the Study

The main objective of this study is to evaluate the impact of liquidity on profitability of development banks in Nepal. Other specific objectives are as follows:

a. To assess the position of liquidity (i.e. cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank size) and profitability (i.e. return on assets and return on equity) of development banks.
b. To examine the relationship between liquidity (i.e. cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank

size) and profitability (i.e. return on assets and return on equity) of Nepalese development banks.

c. To analyze the impact of development banks liquidity (i.e. cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank size) on the profitability (i.e. return on assets and return on equity) in Nepalese development banks.

1.4 Research Hypotheses

The following hypotheses were developed to break down the above research questions. Therefore, this research work attempted to test the following hypotheses in the case of Development banks in Nepal.

H1: Cash reserve ratio has significant impact on profitability of development banks.

H2: Liquid assets to total assets ratio has significant impact on profitability of development banks.

H3: Loan to deposit ratio has significant impact on profitability of development banks.

H4: Capital adequacy has significant impact on profitability of development banks.

H5: Bank size has significant impact on profitability of development banks.

1.5 Rationale of the Study

This study intends to help the national economy through mobilization of idle capital of average Nepalese in productive sectors to accelerate the economic growth and to reduce dependency on foreign assistance and loan. This study is help regulatory authority to find out liquidity management of the development banks. It can be a reference to the concerned personnel and researchers. This study is also show and suggest the available investment opportunities satisfying the objectives liquidity of development banks. The study has various significant. The study is mainly beneficial to the investors, depositors and other creditors to identify the productivity of their funds in the development banks. Then, policy makers at the macro level that is government and Nepal Rastra Bank also get benefited regarding the formulation of further policies in regard to economic development through financial institutions. The study also compels the management of respective development banks for self-assessment of what they have done in the past and guides them in their future plans and programs. Moreover, every individual as well as further researcher can be a good source of literature for review about the findings done by this study.

1.6 Limitations of the Study

The study is important document in context of liquidity and profitability in Nepalese financial sectors. Study is limited to the following:

a. The study is limited to only three development banks of Nepal.
b. This study concentrates only liquidity as cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio and capital adequacy ratio and their impact on profitability as return on assets and return on equity and ignores the other financial aspects.
c. Only secondary data is used for analysis so the reliability of the results depends on the source of data.
d. The study is limited to the past ten years from 2012/13 to 2021/22.
e. Limited financial tools as cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio, bank size, return on assets and return on equity and statistical tools as mean, standard deviation, coefficient of variation, correlation analysis and regression tools are used for analysis.

CHAPTER - II
LITERATURE REVIEW

Literature review is a stocktaking of available literature in one's field of research. Review of literature is an important part of any research work. It provides the boundary line for any research. Previous studies provide the foundation for present study. So, previous studies cannot be ignored. There must be continuity in research.

2.1 Theoretical Review

The objectives of a financial sector's safety, profitability, and liquidity seem to contradict with one another. Occasionally, economists have attempted to overcome these contradictions by establishing specific theories. In actuality, these ideas or concepts control how assets are distributed while keeping these goals in mind. They are sometimes referred to as the theories of liquidity, and they are covered in the following ways:

2.1.1 Loan Theory or Real Bills Doctrine

During the early 1920s, this hypothesis developed. According to the real bills philosophy, financial institutions should only provide business organizations with short-term, productive loans that self-liquidate. Loans designed to finance production, storage, transportation, and distribution are known as self-liquidating loans. The loans are thought to automatically liquidate when such things are eventually sold. Three benefits come with such a short-term self-liquidating productive debt. They automatically liquidate themselves because, first of all, they have cash. Second, there is little chance of their incurring bad debts because they develop quickly and are used for beneficial uses. Third, since these loans are profitable, development banks benefit financially (Sinkey, 1983).

2.1.2 Asset Conversion or the Shift Ability Theory

Later in the 1940s, this hypothesis was refined. According to H.G. Moulton, the shift ability theory of finance company liquidity can be applied without depending on maturities if financial companies have a significant amount of assets that they can transfer to other development banks for cash in an emergency without suffering a

significant loss. This perspective states that in order for an asset to be completely shiftable, it must be instantly transferable without causing capital loss when the demand for liquidity materializes. But in a general crisis requires that all development banks should possess such assets, which can be shifted on the central bank, which is the lender of the last resort. This theory has certain elements of truth (Miller, 1988).

But it has its weakness. First off, the financial system does not get liquidity from assets' simple shift ability. It is totally dependent on the state of the economy. Second, the shift ability argument fails to take into account the fact that the financing firm is unable to transfer shares and debentures to other parties during periods of severe depression. Nobody wants to purchase them in such a scenario, and those who do want to sell them. Third, even if a single finance business could have enough shiftable assets, the financial system as a whole might suffer if it attempts to sell them during a run on the company. Fourth, both lenders and borrowers would eventually suffer greatly if all financial companies were to relocate their assets at the same time.

2.1.3 The Anticipated Income Theory

H.V. Proch's expected income hypothesis was created in 1950 and was based on the practice of granting term loans. This idea states that the financing firm prepares the long-term loan's liquidation from the borrower's expected revenue, irrespective of the type and form of the borrower's business. A term loan is one that lasts more than a year but less than five years. It is awarded in opposition to the hypothecation of stock, machinery, and even real estate. When issuing this loan, the finance business places limitations on the borrower's financial activity. In addition to the security, the financing business considers the borrower's expected earnings at the time of loan issuance. In fact, the anticipated income is the main consideration.

Because it satisfies the three goals of liquidity, safety, and profitability, this theory is preferable to the shift ability hypothesis and the real bills doctrine. The financing business guarantees liquidity when the borrower maintains savings and makes timely installment loan repayments. It complies with the safety principle as the financing firm offers a loan based on the borrower's capacity to repay the loan during its length and their guarantee of a steady income, in addition to a strong security. Finally, the term loan has a lot of advantages for the company (Sinkey, 1983).

2.1.4 The Liabilities Management Theory

Late in the 1960s and early in the 1970s, this hypothesis was created. This idea holds that development banks can borrow reserve money in the money market in case of necessity, negating the requirement for them to make self-liquidating loans and maintain liquid assets. Reserves are obtained by a finance firm by the creation of new obligations against it from various sources. These sources include the issuance of time certificates of deposit, borrowing from the central bank or other financing companies, issuing shares to raise cash, and pouching back earnings. We quickly go over these development bank sources (Sinkey, 1983).

2.2 Conceptual Review

2.2.1 Models of Liquidity

Any institution may create liquidity under the liquidity management program by controlling its profitability. While the conventional model illustrates a significant portion of cash management, it is insufficient to demonstrate the proper use of funds. As a result, a number of models have been created to calculate cash balance and preserve profit position. The Baumol Model, which is based on the high-low cash balance, is one method of combining the cash balance with loan investment. According to Nepal Ratra Bank (2022), the following models are explained as follows:

a) Baumol Model

This model suggests that the cash balance should be kept to a minimum and that any monies that are not needed right away should be invested in order to minimize the opportunity cost of keeping cash and maximize the return on the investment. The Boumol Model shows that the economic order quantity model recognizes cash maintenance as being similar to inventory maintenance. The foundation of the Baumol Model is the idea that:

- Cash is used at constant rate
- The periodic cash requirement is more or less save.
- There is some cost such as the opportunity cost that increase and other cost such as transaction cost that decrease cash balance

- Hence Baumol has conducted that minimum size is the amount of cash that is enough to start with at the beginning of the period to meet the cash need of that period transaction.

Formula for Baumol Model:

$$\text{Optimal C} = C^* = \sqrt{\frac{2TF}{r}}$$

Where,

C = Optimum balance

T = Total amount of cash needed

F = Fixed cost per transactions

r = Opportunity cost of holding cash (Baumol, 1962).

b) Miller Model

All liquidity needs shouldn't be kept in cash with no return due to the significant opportunity cost. For transition and compensation balance requirements, a cash balance must be maintained; however, cash is not required for the liquidity needed for other purposes. As a result, by properly allocating the available money between cash and loan investment, any financial institution may benefit. The pattern and level of input and outflow regulation determine the quantity of cash demands. In light of this, Miller created the Miller Model, a model that advises whether and how much format should be transferred to investment accounts and vice versa while also accounting for the true cash flow pattern. The foundation of this model is the presumption that the daily net cash flow, both in terms of its quantity and its direction (positive or negative), is random. As a result, this model established a range of high and low limitations that permit fluctuations in the cash balance and establishes the goal cash balance as being between these two limits.

Formula for Miller Model:

$$\text{Target cash balance} = Z = 3\sqrt{\frac{3\sigma^2 F}{4k_d}} + L$$

Where,

Z = Optimum transfer amount

σ^2 = Variance in daily net cash flows

F = Trading cost for marketable securities per transactions

K_d = Interest on marketable securities or opportunity cost of holding cash

L = Lower control limit (Miller, 1988)

2.2.2 Development Bank Liquidity Factors

Basically, need of development banks liquidity is affected by the following factors (Singh & Khadka, 2001):

External Environmental Factors

Prevailing Interest Rate: There won't be as much need for liquidity if development banks have high interest rates since there will be less need for cash.

Savings and Investing: While high income and saving levels result in low liquidity demands, high investment levels result in high liquidity requirements.

Development and Declining Status of the Financial Market: Development and advancement in the financial and economic spheres result in reduced liquidity requirements, whereas declines in these areas result in increased liquidity requirements.

Internal Environmental Factors

Development Bank Lending Strategy: Should a bank choose to implement a long-term or mid-term lending strategy, it must maintain a high degree of liquidity. If not, a low level of liquidity requirement is applicable to the bank implementing the short-term investment policy.

Management Capacity: Low liquidity necessitates risk-taking and competent risk management. Additional significant liquidity requirements for risk averters, coupled with inadequate or ineffective management.

Strategic Planning and Fund Flow Situation: The goals, strategies, and investment strategy of development banks have an impact on liquidity requirements. Lending policies and the state of cash flow also have an impact. There will be a high demand for liquidity if the bank has accumulated a greater amount in current accounts compared to other accounts; otherwise, there will be a low need for liquidity. It is dependent upon development banks' assets and liabilities matching in terms of maturity.

2.2.3 Liquidity Management Strategy

In order to control liquidity, Nepal Rastra Bank has a monitoring strategy that may be used to increase or decrease the development banks' ability to provide loans. The primary causes of the increase in liquidity are domestic loans and foreign capital. By implementing monetary policy, the central bank loses the ability to regulate the rise of forcing capital. Since development banks are the primary providers of internal loans and utilize monetary policy as a primary tool for controlling liquidity, the central bank employs it in conjunction with its internal loan program. The central bank focuses on two main aspects of managing liquidity: preventing the low liquidity that development banks require to conduct their business and protecting the economy from the long-term effects of high liquidity and liquidity crises (Nepal Rastra Bank, 2022).

Deposits are referred to as the raw materials of financing, without which development banks are unable to function, thus they should be drawn to them. Making a judgment on which industry the deposit will go into is crucial. For development banks, the most significant liability is the size of the current account. Still, it ought to come back right away when needed. Therefore, a liquid fund is required. Even though the loan and advance business is the most lucrative one in terms of assets, it is not paid back when it is needed (Al-Husainy & Jadah, 2021).

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Therefore, a development bank's most crucial functions are to arrange for liquid assets from its own assets, to lend money, to establish the amount of investment, and to coordinate the assets and liquidity. When providing the development bank with instructions on liquidity, the central bank also takes this fact into consideration. The development bank should take a number of issues into account while developing its liquidity management plan. The development banks may not have a favorable outcome if they are unable to formulate a sound plan. Bake fluidity is quite significant (Christopoulos et al., 2013). Therefore, development banks should set the following strategies for the management liquidity.

a) Strategy Relating to Deposit

The development banks let their clients to open current, savings, and fixed accounts. Cash deposits can be made by regular individuals, organizations, and institutions in development banks based on their needs. These funds can be amassed significantly as

deposits in development banks. The development banks should decide how much money is going to be put, into which account, at what interest rate, and for what length of time. They should also set a minimum and maximum duration for the deposits. It is possible to assess the amount accumulated as a deposit in order to create the liquidity strategy. Setting up a liquidity management plan is an internal concern for development banks; by doing so, they may achieve their objectives.

b) Strategy Relating to Investment

If there is a lack of liquidity, the development banks are unable to make investments. To make money, though, the development banks ought to invest. This is where the liquidity comes in. The goal of the development banks' establishment is to earn a profit. Because of this, the development bank is unable to achieve its objective. A development bank should establish a plan for investing the remaining cash money while maintaining the stock, which is necessary for daily liquidity (Vaidya, 2017).

c) Strategy Relating to Reserve Fund

Money from a development bank ought to be placed in various funds. There is a fund that requires a mandatory cash deposit. It will have to deal with a catastrophe if it is unable to deposit these sums in full. To protect itself against such calamity, it ought to have strong liquidity management capabilities. It creates a fund for reserves. This reserve fund holds a portion of the profits earned from operations. The development bank should establish a policy on the quantity of cash that should be retained in the bank and the amount that should be transferred for investments (Wuave et al. 2020).

d) Strategy Relating to Dividend

A development bank pays its shareholders a portion of its profits as dividends. However, in the event that liquidity is scarce, share certificates may be distributed in lieu of cash. However, the administration of the development bank has to know whether or not these conditions exist there. In the event that liquidity is scarce, the distribution of share certificates should come first. If there is sufficient liquidity in the development banks, it is preferable to establish the cash distribution plan (Zidan, 2020).

e) Strategy Relating to Capital

A development bank need funding to operate after it is founded. It has the ability to open new branches or subbranch. This might require a large amount of cash. The financial firm may raise cash under these circumstances by issuing bonds and shares. It somewhat mitigates the liquidity issue. The development bank needs to decide on a plan before issuing any shares or debentures. The development bank can execute a sound transaction by implementing the above-mentioned liquidity management techniques. Additionally, if the cash stock is lower than what the Nepal Rastra Bank specifies, there is a provision to pay a punishment. Therefore, managing liquidity is a crucial component for development banks in order to keep liquidity in balance (Nepal Rastra Bank, 2022).

2.2.5 Concept of Profitability

In the business world, profit is the difference in value between the costs of producing and selling goods and services and the final prices that are paid for them. In the economy, making a profit is a necessary component of competition while purchasing and selling goods. Loss is the inverse of profit, occurring when the cost of creating an item or service exceeds what a customer is prepared to pay. Profits are the basis for making decisions in a free market economy; this is known as the profit motive. The theory of the company has cast doubt on the universality of what is typically understood to be the fundamental motivation for business. Particularly Japanese businesses are known for prioritizing market share over immediate financial gain (Rudhani & Balaj, 2019).

There are several meanings associated with the term "profit." Prof. Knight claims that profit is the term or idea that is employed in economic discourse with the most confusing range of established meanings. Some authors have described it as the percentage return on capital invested, while others have referred to it as the ownership reward. It has been described as a reward for taking risks by some and as an entrepreneurial reward by others. Others have further defined profit as the amount of money left over after the three production factors are all paid for. It seems that separating gross profit from net profit is essential to understanding profit accurately (Seth, 1998).

The amount of money received from a sale that exceeds the amount of money paid, or simply the profit. A reward for engaging resources in conditions of speculative risk for the satisfaction of consumer demand, profit is defined by the dictionary of commerce as the surplus that results after a defined trading period. Nevertheless, profit must be regarded as the first essential charge upon business. It provides resources to invest in operations going forward, hence its absence must lead to a decrease in effective capital resources and eventually the business's competitive extinction (Saleh et al., 2020).

Being an owner-oriented term, it refers to the quantity and percentage of national revenue that firm owners—those who provide equity capital as a variation on profitability—are compensated. Put differently, profitability denotes a state in which the value generated by the utilization of resources surpasses the entire amount of resources used. Profitability is a phrase that deviates from "profit" and refers to the capacity to turn a profit as the primary indicator of a commercial enterprise's performance. It is only describing the fundamental test performance of every firm. Profit is defined as the excess of sales revenue over expenses, yet the term "profit" is highly contested and has several meanings.

The amount of profit generated as a result of each company operation's efficiency is measured by profitability analysis. In operations, profitability analysis mostly entails assessing strategic company units or market sectors. The primary purpose of profitability analysis is to examine and enhance an organization's earnings by examining the information that is already accessible. These support a company's internal accounting and decision-making processes in the areas of product management, marketing, and sales (Khan & Jain, 1993).

Every company has a variety of objectives. Maximizing profits is the aim of business. For a business, profit is everything. It holds the same significance as water. to pay for ongoing expenses associated with operating a firm, such as replacing furnishings and equipment, managing market or technological risks, etc. In the context of the self-financing principle, profit is crucial. It lowers the cost of capital and offers structure. An enterprise's profitability attracts investors. So, when there is a sufficient profit, investors would put their money to work. Therefore, in order to guarantee and fulfill

the expectations of management, owners, investors, employees, and the country at large, profit is necessary (Khati, 2020).

2.2.5 Measurement of Finance Company Profitability

For development banks' shareholders, staff, management, and creditors, profitability is crucial. Return on Equity, Net Interest Margin, and Return on Asset are a few metrics that are frequently used to gauge the profitability of development banks. Net income or profit after taxes is divided by total assets to determine return on assets, or ROA. Net income over the average total assets is another way to assess it. Greater ROA demonstrates the development banks' superior performance (Garrinson & Norren, 2005).

The ratio of total common stock equity to net income or profit after taxes is known as return on equity, or ROE. Net income over average total common stock equity is another way to calculate it. This ratio assesses the management's level of caution in using shareholder funds to protect shareholders' interests and increase their net value (Garrinson & Norren, 2005).

Furthermore, net interest income over loan and advance is used to calculate net interest margin. It demonstrates the effectiveness of management. It displays the management's ability to make use of the deposits that are accessible. The growth of interest revenue is essential to development banks. Put differently, this suggests that a large amount of interest revenue is a sign of successful lending operations and vice versa (Glautier & Underdown, 2001).

The difference between the interest revenue that development banks or other financial institutions create and the interest that is paid to their lenders (for example, on deposits) in relation to the total value of their (interest-earning) assets is known as net interest margin, or NIM. It's a performance measure that looks at how well a finance firm manages its debt in relation to its investment choices. Because interest costs exceeded the profits from investments, a negative number indicates that the company did not make the best choice (Kajola et al., 2019).

2.2.6 Provisions of Nepal Rastra Bank

After exercising the authority granted by NRB directions, 13, 2076, the following directions have been published regarding the mandatory reserve and liquid assets that a licensed institution must keep depending on its deposit and borrowing liabilities.

Provisions relating to Compulsory Reserve

"B" class development banks can collect Deposits of General Public.

(1) Class "A" institutions that have licenses from this bank and accept current or call accounts are required to keep a deposit with the bank equal to four percent of their total deposit liabilities (Nepal Rastra Bank, 2022).

Should the balance required to be maintained as per Subclause (1) above not be reached, the following penalties will be applied:

(a) for the first instance of a shortfall in maintaining the mandatory reserve, the amount will be charged at the percentage of the current bank rate;

(b) for the subsequent instance of a shortfall in maintaining the mandatory reserve, the amount will be doubled as the percentage of the current bank rate on the shortfall amount;

(c) The third time, and any other times there are deficiencies in keeping the mandatory reserve, at a rate three times the current bank rate on the shortfall amount.

(3) The computation of "times" under subclauses (a), (b), and (c) above necessitates the computation of distinct times for each fiscal year. Additionally, any licensed institution that neglects to keep mandatory reserve for three weeks in a row will be punished one time for the first week, two times for the second week, and three times for the third week.

(4) The fee on the deficit amount will be applied on a weekly basis at the current bank rate. The amount of the deficit will be split by 52 after being multiplied by the bank rate percentage.

(5) The following steps must be taken in order to calculate the mandatory reserve that must be kept: -

(a) Every week, from Sunday to Saturday, the mandatory reserve will be reviewed.

(b) The mandatory reserve will be compared to the average weekly deposit liability balance for the two weeks before. If a given week has all of its holidays, the average deposit from the week before will be taken into account.

(c) The weekly average of all deposit liabilities and balances held with this bank will be calculated 360 for the purpose of calculating obligatory reserve. This will be achieved by adding up all daily balances from Sunday to Saturday and dividing the total by seven. In doing so, the amount from the day before will be taken into account if there are any holidays in the week.

d) For this purpose, within seven days of the end of the week, all information pertaining to Sunday through Saturday (including the balance from the previous day in the event of a holiday) must be mandatory submitted to the relevant Supervision Department of this Bank in the format specified in Directives Form No. 13.1.

(6) A licensed institution's offices will be considered a single unit for this purpose.

(7) The balance kept with this bank will include any local currency that is in transit for a money transfer and intended to be credited to the account.

Provisions Relating to Statutory Liquidity Ratio

The statutory liquidity ratio must be maintained by licensed banks and financial institutions of classes "A," "B," and "C" at the rate that is periodically mandated. Government securities, the amount in the call deposit in the class "B" development bank for the same purpose, and the remaining amount over the amount required for the compulsory reserve ration may also be calculated as the eligible instruments, provided that the statutory liquidity ratio as specified by this provision is maintained. Ten percent of local deposits should be kept by "B" development banks. The statutory liquidity ratio computation is subject to the following requirements (Nepal Rastra Bank, 2022):

(1) The statutory liquidity ratio will be computed using the domestic deposit liability that was maintained at the end of the previous month.

(2) This ratio must be computed, and in accordance with Directive Form No. 13.3, the statement containing the statutory liquidity ratio amount for each full month must be filed.

(3) If they said that the deposit is insufficient, the following penalties will be applied,

(a) In accordance with the guidelines in NRB directives, 2075: the percentage of the current bank rate for the amount that is insufficient in situations where the statutory liquidity ratio falls short for the first time.

(b) At twice the percentage of the current bank rate for the amount fallen short in situations where the statutory liquidity ratio is not met for the second time.

(c) In situations where the statutory liquidity ratio is not met for the third time or at any subsequent time, the amount that is not met is equal to three times the current bank rate.
(4) A distinct time must be established for every fiscal year when establishing the time for clauses (a), (b), and (c).
(5) If the monthly account falls short of the statutory liquidity ratio, a fine equal to the current bank rate minus the amount that falls short, multiplied by the percentage of the bank rate and divided by twelve.
(6) The bank rate issued as directed by this Bank must be used as the basis for calculating the punishment in the event that the statutory liquidity ratio is not met.

2.3 Empirical Review

Hermuningsih et al. (2023) investigated the moderating role of bank size: influence of fintech, liquidity on financial performance. The study aimed to investigate the effects of financial technology, liquidity, and bank size on the financial performance of traditional commercial banks in Indonesia. In this work, SmartPLS software was utilized for hypothesis testing (PLS-SEM approach). It was discovered that bank size was a moderating factor for the effects of bank technology on financial performance. Liquidity also had a positive effect on financial performance, and bank size was a moderating factor for the effects of liquidity on financial performance. Financial technology was found to have a positive effect on financial performance.

Ojo et al. (2022) investigated liquidity management on performance of deposit money banks in Nigeria. The study examined how Nigerian banks performed from 1986 to 2020—a 35-year period—and how liquidity management affected their results. For the inquiry, inferential statistics were employed, including the Autoregressive distributed lag model. Time series data on the loan to deposit ratio, return on shareholder's money, cash reserve ratio, and liquidity ratio were gathered from the Central Bank of Nigeria Statistical Bulletin. Research findings indicate a possible long-term relationship between bank performance and liquidity management in Nigeria. The study also found that bank performance in Nigeria is positively and significantly impacted by the cash reserve ratio, liquidity ratio, and loan to deposit ratio. Therefore, liquidity management has the ability to enhance bank performance in Nigeria as determined by the cash reserve ratio, liquidity ratio, and loan to deposit ratio. The study's conclusions indicate

that liquidity management significantly and favorably affects bank performance in Nigeria.

Paul et al. (2021) investigated impact of liquidity on profitability: a study on the commercial banks in Bangladesh. The purpose of this study was to look at how banks' liquidity affects their profitability over the medium term—ten years—and in the regular course of business. Bangladesh's commercial banks' performance was assessed using secondary data. The liquidity representation of the proposed variables were LDR, DAR, CDR, LAR, and CR; the profitability representation was ROE. After doing a correlation and regression analysis, it was found that while LAR and CR were not significant, LDR, DAR, and CDR had a significant impact on the profitability as evaluated by ROE. Thus, it can be said that, generally speaking, Bangladesh's commercial banking industry's profitability is greatly impacted by liquidity.

Zidan (2020) investigated impact of liquidity management on the profitability of banks operate in Palestine. The purpose of this study was to elucidate how the profitability of the Palestinian banking industry from 2008 to 2017 was affected by liquidity management. The Palestinian Monetary Authority (PMA) annual reports, the Association of Banks in Palestine, and the audited annual reports of the sample banks were the sources of the data. The empirical study and development of the econometric model, which had one dependent variable and eight independent variables, were done using multiple regression models. Profitability indicators was defined as return on assets (ROA). The results of the study also showed that the capital adequacy ratio and the loans to deposits ratio had a substantial impact on profitability, with the former having the greatest impact.

Budhathoki et al. (2020) investigated the impact of liquidity, leverage, and total size on banks’ profitability: evidence from Nepalese commercial banks. This study looked at how the bank's overall asset size, leverage, and liquidity all affected profitability. Bank scope data from all 28 commercial banks that operated in Nepal between 2010/11 and 2016/17 were used in this study. The effect of leverage, total size, and liquidity on the bank's profitability was examined using three ordinary-least-squares models. The bank's ROA, ROE, and NIM were shown to be negatively impacted by a greater loan to deposit ratio (poor liquidity), according to the first regression model; however, ROE

and NIM were not statistically significant. The second regression model's conclusion indicated that a lower leverage ratio, or greater equity to assets ratio, had a statistically significant positive impact on two profitability indicators, ROA and NIM, but a statistically insignificant negative relationship with ROE. The final regression model result showed that all three profitability measures—ROA, ROE, and NIM—were positively impacted by larger bank sizes, which seemed to be advantageous to Nepalese commercial banks. The study's findings may enable bankers and legislators to make wise decisions that will increase banks' profitability.

Wuave et al. (2020) analyzed effect of liquidity management on the financial performance of banks in Nigeria. This study looked at how Nigerian banks' financial performance was affected by liquidity management between 2010 and 2018. The study makes use of secondary data from five banks that are listed on the Nigerian stock exchange. Liquidity ratios (LQR), loan to deposit ratios (LDR), cash reserve ratios (CRR), and deposit ratios (DR) are used as proxies for liquidity management, and return on assets (ROA), return on equity (ROE), and return on net interest margin (NIM) are used as proxies for financial performance (profitability). The Hausman test and panel regression analysis were employed in the study to estimate the model and select between a fixed effect and a random effect model. It was discovered that the liquidity ratio (LQR), as determined by return on equity (ROE), return on assets (ROA), and net interest margin (NIM), had a favorable and substantial impact on DMB's financial performance. Nigerian banks should set up strong risk management and governance frameworks by creating plans and policies for managing liquidity that are well integrated into their risk management procedures. They should also create a contingency funding plan to handle any liquidity shortage during stressful or emergency situations, making sure that funding needs are actively monitored to prevent liquidity issues that could lead to bank crises.

Swain and Mishra (2020) examined the impact of liquidity management on profitability: evidence from commercial banks of India. The growth and development of the economy are dependent on the state of the nation's banks' finances. As a result, in order to manage each bank's short- and long-term financial health, it is essential to routinely evaluate each one's economic soundness and to create sound financial policies. Data for the study's period of 2005 to 2018 comes from banks in the public

and private sectors (20 and 22, respectively). The data were examined using panel regression analysis, descriptive statistics, and a correlation matrix. In this study, the profitability indicators—such as return on equity and return on total assets—were regarded as dependent variables. Term loans to total advances, net NPA to net advances, demand and savings bank deposits to total deposits, cash deposit ratios, credit deposit ratios, investment deposit ratios, and investment to total assets are considered explanatory factors in the context of liquidity management. The results of the study showed that the profitability of the sample banks was significantly impacted by the variables influencing liquidity management.

Saleh et al. (2020) examined the effect of credit risk, liquidity risk and bank capital on bank profitability: evidence from an emerging market. Using actual data from a developing market, this study sought to determine how bank capital, credit risk, and liquidity risk affected profitability as measured by ROAA, ROEA, and NIM. A fixed effects regression model was used to estimate the model. Furthermore, the system's dynamic panel data estimators were GMMs. The findings provided additional insights into the relationships between profitability and the previously described bank-specific factors (credit risk, liquidity risk, and bank capital). It has been demonstrated that bank capital, credit risk, and liquidity risk may all have a positive or negative impact on bank profitability. On the other hand, the results showed some variations in the impact of factors unique to banks and profitability metrics. These findings might help various institutions, managers, and stakeholders establish and preserve an effective financial system and market, which would have significant ramifications.

Nourrein and Mennawi (2020) examined the impact of liquidity, credit, and financial leverage risks on the financial performance of Islam banks in Sudan during the period of 2008 - 2018. This study employed a panel dataset including 143 observations from 13 banks. Robust random effects estimates have been used to build two ROA and NPM models in order to evaluate the study hypotheses. The financial leverage ratio is one of the independent variables along with credit risks and liquidity. Liquidity risk is determined by the ratios of cash to deposits, liquid assets to total assets, and total loan (financing) to total deposits. Credit risk is determined by the nonperformance of loan (financing) and provision of loan (financing) loss ratios. The return on assets and net profit margin ratios are used to assess the financial performance of Islamic banks in

Sudan. The findings showed that, while liquidity risk was typically deemed to be negligible, credit risk and financial leverage had a major and detrimental influence on the financial performance of Islamic banks in Sudan. Nevertheless, the ratio of liquid assets to total assets indicates that the liquidity risk has a notable and favorable impact on Sudanese banks' financial performance. Lastly, the study's significance lies in the fact that it addresses the most important categories of risks that Sudanese Islamic banks encounter throughout their operating cycles.

Khati (2020) analyzed impact of liquidity on profitability of Nepalese commercial banks. The purpose of this study is to look at the connection between Nepal's commercial banks' profitability and liquidity. The study, which covered the years 2013 to 2019, involved ten of the twenty-seven listed commercial banks. The secondary data used in this study were taken from the annual reports of the chosen commercial banks and the Bank Supervision Reports issued by Nepal Rastra Bank. Return on equity (ROE) and return on assets (ROA) are the surrogates for profitability, whilst the credit-deposit ratio (CDR), cash-deposit ratio (CADR), and assets quality (AQ) are the measures of liquidity. Asset quality (AQ) had a negative and significant association with return on assets (ROA), but a positive and substantial link with return on equity (ROE), according to the results of the Hausman test and the fixed effects method. There was a positive but negligible correlation between return on equity (ROE) and return on assets (ROA) and the cash-deposit ratio (CADR). Nonetheless, the research demonstrated that there was a negative and negligible correlation between credit-deposit (CDR) and return on equity (ROE), and a positive but small correlation between CDR and ROA.

Pokhrel and Pokhrel (2019) examined impact of liquidity on profitability in Nepalese commercial bank. The study looked at how liquidity affected Nepalese commercial banks' earnings. The study's sample period ran from 2010–11 to 2016–17 AD. Using a range of statistical and financial methods, the research looked at profitability situations and liquidity management. The average profitability of commercial banks was shown to follow a zigzag pattern, despite the bank's liquidity ratios showing an unpredictable tendency. The bank's liquidity ratios were discovered to be below the recommended level. In a similar vein, CRR was far higher than that required under the 2016–17 monetary policy. While CRR and CBBISD showed an unfavorable correlation with

ROA, CRR and IGSCA showed a positive correlation with ROA. Regarding the liquidity-ROE relationship, the correlation between CR and ROE was negative, whereas the correlation between the other ratios (CRR, CBBISD, and IGSCA) and ROE was positive. Similarly, it was shown that liquidity ratios and profitability had a strong correlation, with the exception of IGSCA and ROA.

Kajola et al. (2019) investigated the liquidity and profitability: evidence from the Nigerian Banking Sector. Using data from 10 Nigerian deposit money banks between 2008 and 2017, the study looked at how liquidity management affected profitability. The four indicators that acted as a stand-in for liquidity management were the liquidity ratio, the deposit to asset ratio, the loan to deposit ratio, and the return on asset. The estimate approach for the data analysis in this study was Random Effects Generalized Least Squares. Return on asset and two liquidity management proxies—the current ratio and the liquidity ratio—were shown to be positively and statistically significantly correlated. The study's findings revealed an insignificant link between the loan to deposit ratio ($t = 1.0650$, $p = 0.2896$) and deposit to asset ratio ($t = -0.6507$, $p = 0.5168$) and their impact on the profitability of the chosen banks.

Fagboyo et al. (2018) investigated impact of liquidity management on profitability in Nigeria’s banking sector. The purpose of this study was to examine how Nigerian deposit money banks' profitability is affected by their approach to liquidity management. The 10 years of this study were from 2007 to 2016. Returns on equity (ROE) and return on assets (ROA) served as stand-ins for profitability, while square measure quick ratio, cash ratio, current ratio, and liquidity coverage ratio were employed as liquidity indicators. The idea was tested using regression analysis. It was discovered that the performance of deposit money institutions is significantly impacted by liquidity management. As previously said, it was also discovered that an increase in the fast ratio of available funds leads to a rise in profitability, while an increase in the cash ratio and the liquidity coverage ratio resulted in a fall in the profitability of Nigeria's deposit cash banks.

Bhatt and Verghese (2018) examined influence of liquidity on profitability: evidence from Nepalese banks. The purpose of this study was to investigate the connection between Nepal's commercial banks' profitability and liquidity. In this regard, a sample

of 14 Nepalese commercial banks was chosen for the study, and information on their finances was obtained from the banks' 2008–2017 annual reports. The return on assets and net profit margin were utilized in this study as profitability indicators, and the capital, investment, and liquidity ratios were employed as stand-ins for liquidity measures. Inferential statistics were employed in this study to provide a quantitative explanation of the key characteristics of a set of data, and correlation and linear regression analysis were utilized to analyze the data. The findings demonstrated that the liquidity factors projected a bank's profitability to be higher than 49% as determined by return on assets and net profit margin. The empirical research indicates that the correlation between the liquidity ratio and return on assets was not statistically significant. The investment ratio and capital ratio with return on assets also have a negligible negative association. Additionally, a negligible positive correlation between the net profit margin and the investment and liquidity ratios was discovered. Nonetheless, there is a notable inverse relationship between the capital ratio and the net profit margin.

Idowu et al. (2017) examined liquidity management and bank performance in Nigeria. In the banking sector, managing liquidity and profitability was a critical concern. This study used the Pearson correlation coefficient approach to examine four deposit money banks in Nigeria from 2007 to 2016. The empirical findings showed a statistically significant correlation between return on equity, return on asset, and liquidity of banks. When return on asset was utilized as a stand-in for profitability, the link is not as statistically significant. It was recommended that the banks assess and rework their liquidity management plan to maximize returns on shareholder equity and to make the best use of their assets. The study demonstrated how effective management and regulation of the variables affecting the nation's commercial banks' liquidity might enhance the banks' financial performance.

Pradhan and Shrestha (2016) analyzed impact of liquidity on bank profitability in Nepalese commercial banks. The study looked at how Nepalese commercial banks performed in relation to liquidity. To determine the importance and impact of bank liquidity on the performance of Nepalese commercial banks, regression models were estimated. According to this study, there is a positive link between capital ratio and return on equity, meaning that a greater capital ratio corresponds to a better return on

equity. However, it is discovered that there is a negative connection between return on equity and liquidity ratio, meaning that the larger the bank's liquidity, the lower the return on equity. Furthermore, it was discovered that there was a negative association between return on equity and quick ratio. The investment ratio and capital adequacy beta coefficients have a positive correlation with bank performance, suggesting that higher investment and capital ratios enhance bank performance. The fast ratio and liquidity ratio's beta coefficients, on the other hand, are negative for the bank's return on equity and return on assets, suggesting that a higher quick ratio will result in a worse return on equity and return on assets.

Table 1

Summary of Empirical Review

Author	Title	Objective	Methodology	Findings
Hermuningsih et al. (2023)	The moderating role of bank size: influence of fintech, liquidity on financial performance. Jurnal Siasat Bisnis	The objectives of the study was to examine the impact of financial technology, liquidity, and bank size on financial performance in Indonesia's conventional commercial banks.	This study used hypothesis testing using SmartPLS software (PLS-SEM method).	It was found that financial technology had a positive effect on financial performance, bank size was a moderating variable for the repercussions of financial technology on financial performance, liquidity also had a positive impact on financial performance, and bank size was a moderating variable for the effectiveness of liquidity on financial performance.
Ojo et al. (2022)	Liquidity management on performance of deposit money banks in Nigeria.	The study evaluated the effects of liquidity management on bank performance in Nigeria over a 35-year period, from 1986 to 2020	Inferential statistics were used in the investigation, which included the Autoregressive distributed lag model.	This study found an evidence of a long-run association between liquidity management and bank performance. The study also found that the cash reserve ratio, liquidity ratio, and loan to deposit ratio all have a favorable and significant impact on bank performance.
Paul et al. (2021)	Impact of liquidity on profitability: A study on the commercial	This research aimed to investigate the effect of banks' liquidity on its profitability.	This study used correlation and regression analysis.	This study found that LDR, DAR and CDR had a substantial effect on the profitability measured as ROE, but LAR and CR proved insignificant.

	banks in Bangladesh.			Therefore, it can be concluded that, the impact of liquidity had a significant effect on the profitability.
Saleh et al. (2020)	The effect of credit risk, liquidity risk and bank capital on bank profitability: Evidence from an emerging market.	The main objective of the study was to analyze the effect of credit risk, liquidity risk, and bank capital on profitability.	The model was estimated through a fixed effects regression model. Additionally, GMMs were used as the dynamic panel data estimators for the system	The results offered supplementary perceptions of causality between the aforementioned bank-specific variables (credit risk, liquidity risk and bank capital) and profitability. Credit risk, liquidity risk, and bank capital were shown to affect bank profitability in either a positive or negative way.
Khati (2020)	Impact of liquidity on profitability of Nepalese commercial banks.	This study sought at investigating the relationship between the liquidity and the profitability of commercial banks in Nepal.	By using Hausman test and thereafter fixed effects regression model was employed.	The findings indicated that while assets quality (AQ) had a positive and significant link with return on equity, it had a negative and significant relationship with return on assets (ROA). Return on equity and return on assets were positively and marginally correlated with the cash deposit ratio.
Nourrein and Mennawi (2020)	The impact of liquidity, credit, and financial leverage risks on the financial performance of Islam banks in Sudan.	This study empirically investigated the impact of liquidity and credit risks plus financial leverage on the financial performance of Islam banks in Sudan during the period from 2008 to 2018.	Two models of ROA and NPM have been constructed using robust random effects estimates for testing the study hypotheses.	The findings showed that, while liquidity risk was typically deemed to be negligible, credit risk and financial leverage had a major and detrimental influence on the financial performance of Islamic banks in Sudan. Nevertheless, the ratio of liquid assets to total assets indicates that the liquidity risk has a notable and favorable impact on Sudanese banks' financial performance.
Swain and Mishra (2020)	Exploring the impact of liquidity management on profitability: Evidence from commercial banks of India.	The study studied about the determinants of liquidity management and the impact of such determinants on ROA and ROE was examined.	Panel regression analysis, descriptive statistics, and a correlation matrix were used to analyze the data.	The results of this study showed that while the loan to deposit ratio had an insignificantly beneficial impact on ROA, the cash to deposit ratio, investment to total assets ratio, term loan to total assets, and demand and savings bank deposit to total deposits ratio all had significant positive effects on ROA.

Wuave et al. (2020)	Effect of liquidity management on the financial performance of banks in Nigeria	This study examines the effect of liquidity management on financial performance of banks in Nigeria for the period 2010 to 2018.	The study uses panel regression analysis in estimating the model and Hausman test while making a choice between fixed effect and random effect model.	According to the study, the liquidity ratio (LQR) significantly and favorably affects DMB's financial performance as indicated by its return on equity (ROE), return on assets (ROA), and net interest margin (NIM).
Budhathoki et al. (2020)	The impact of liquidity, leverage, and total size on banks' profitability: evidence from Nepalese commercial banks.	The main objective of the study was to analyze the effect of liquidity, leverage and total assets size of the bank on profitability of banks.	Three ordinary-least-squares models were applied in this study.	The study revealed that the higher loan to deposit have the negative effect on ROA, ROE, and NIM; however, ROE and NIM were statistically insignificant. Then, equity to assets ratio positively affected two profitability measures, ROA and NIM, and was statistically significant but was negatively related to ROE and insignificant.
Zidan (2020)	Impact of liquidity management on the profitability of banks operate in Palestine.	This study aimed to explain the effect of the liquidity management on the profitability of the Palestinian banking sector during the time period 2008–2017.	Multiple regression models were used to do the empirical analysis and; develop the econometric model.	The findings and analysis revealed that loans to deposits ratio had the most important significant effect on profitability and capital adequacy ratio had also significant impact on profitability. cannot be generalized to other sectors.
Kajola et al. (2019)	Liquidity and profitability: Evidence from the Nigerian Banking Sector.	The study examined the effect of liquidity management on profitability in ten deposit money banks in Nigeria between 2008 and 2017.	Using Random effects generalized least squares as estimation technique	The current ratio and the liquidity ratio, two proxies for liquidity management, were found to have a positive and statistically significant association with return on asset. The study found no empirical evidence to support the hypothesis that the deposit to asset ratio and the loan to deposit ratio have an impact on the profitability of the chosen banks.
Pokhrel and Pokhrel (2019)	Impact of liquidity on profitability in Nepalese Commercial Bank	The objective of this study is to examine the liquidity (LQD) determinants of Indian listed commercial banks.	This study has used secondary data using MS Excel and has been tested through descriptive statistics,	The study came to the conclusion that banks' liquidity ratios fell short of the required level. In a similar vein, CRR was far higher than that required by monetary policy in 2016–17. While CRR and CBBISD

			correlation and regression.	showed an unfavorable correlation with ROA, CRR and IGSCA showed a positive correlation with ROA. Regarding the liquidity-ROE relationship, the correlation between CR and ROE was inverse, whereas the correlation between the other ratios (CRR, CBBISD, and IGSCA) and ROE was positive.
Bhatt and Verghese (2018)	Influence of liquidity on profitability: Evidence from Nepalese banks.	This study sought to examine the relationship between the liquidity and the profitability of commercial Banks in Nepal.	Inferential statistics were employed in this study to provide a quantitative explanation of the key characteristics of a set of data, and correlation and linear regression analysis were utilized to analyze the data.	Based on empirical data, the liquidity ratio and return on assets have a negligible positive correlation. The investment ratio and capital ratio with return on assets also have a negligible negative association. Additionally, it is discovered that the net profit margin and the investment and liquidity ratios have a negligible positive correlation. Nonetheless, there is a notable inverse relationship between the capital ratio and the net profit margin.
Fagboyo et al. (2018)	Impact of liquidity management on profitability in Nigeria's banking sector.	This article seeks to analyze the impact of liquidity management on profitability within the Nigerian deposit money banks.	This covers the period of ten years (2007-2016). Regression analysis was used to test the hypothesis.	The findings indicate that liquidity management considerably impact on the performance of deposit money banks The empirical results additionally shows that a rise within the quick ratio of accessible funds results in a rise within the profitability, whereas a rise within the cash ratio and the liquidity coverage ratio results in decrease within the profitability of the deposit cash banks in Nigeria.
Idowu et al. (2017)	Liquidity management and bank performance in Nigeria.	This study tries to maximize their profit at the expense of liquidity.	This study was carried out on four deposit money banks in Nigeria between 2007 and 2016, using Pearson correlation co-efficient technique.	The empirical results revealed that there is a statistically significant relationship between banks' liquidity, return on asset and return on equity. However, the relationship is not all that statistically significant when return on asset was used as proxy for profitability.

Pradhan and Shrestha (2016)	Impact of liquidity on bank profitability in Nepalese commercial banks.	The objective of the study was to examine the effect of liquidity on the performance of Nepalese commercial banks.	Regression models were utilized to extract secondary data from bank annual reports and Nepal Rastra Bank's supervisory report.	A positive correlation was seen between the capital ratio and return on equity, suggesting that a greater capital ratio would correspond to a better return on equity. Nevertheless, it was discovered that there was a negative correlation between return on equity and liquidity ratio, meaning that the return on equity would be lower the higher the bank's liquidity.

2.4 Research Gap

It refers to the study gap related to previous studies. Previously, various research studies were made regarding liquidity and profitability of different banks by different students, experts and researcher. However, the limited findings, extensive testing and adjustment in necessary variables limits result of previous study. Since those studies have limitation on their research, a new research study was required and validating.

The purpose of this research work and previous studies is quite different. Firstly, the studies of liquidity and profitability of banks were made on different period. They had studies the liquidity and profitability of banks on old periods. It became necessary to do new research study on liquidity and profitability of recent periods. Similarly, the impact of liquidity on profitability evaluation of three development banks was not available on previous studies. To overcome this lacking, a new research study was required to evaluate the liquidity and profitability of three development banks. Moreover, this study is also different with previous studies in explanatory variables such as cash reserve ratio, liquid assets to total assets ratio, loan to deposit ratio, capital adequacy ratio and bank size and dependent variables, profitability (return on assets and return on equity to analyze the impact of liquidity of profitability of Nepalese development banks. However, to overcome the limitation of previous studies, this study includes different tools of descriptive analysis (i.e. mean, SD and CV) correlation analysis, and regression analysis as specific tools which were not included in previous studies. This study can provide the clear conceptual idea and knowledge of liquidity. That’s why, this study tries to fulfill research gap to some extent.

CHAPTER - III
RESEARCH METHODOLOGY

This chapter explains the procedures, instruments, methods, and approaches employed in the report's preparation and data analysis. It involves meticulous study, particularly by looking for fresh information in any field to determine the best research methods. The study's goals have been attained by employing the following approach.

3.1 Research Design

A well-defined research design guarantees that the data gathered is pertinent to the study objectives and is gathered using economical, objective methods. Both descriptive and causal comparative studies have been done in order to meet the study's specific goal. The pattern and condition of profitability and liquidity are examined using descriptive design. The effect of liquidity on the profitability of Nepalese development banks is assessed using the causal comparative approach.

3.2 Population, Sample and Sampling Design

Nowadays a number of development banks have been merging. Currently, there are 16 development banks in Nepal. In this study, all the development banks are population of the study. Among them three development banks have been selected as sample. Purposive sampling technique is used in this study because these development banks are top three in terms of profitability in present context and they have strongest liquidity position among the development banks. The sample development banks of the study are; Jyoti Bikash Bank Limited, Muktinath Bikas Bank Limited and Garima Bikas Bank Limited.

3.3 Nature and Sources Data, and Instrument of Data Collection

To conduct this study, secondary data are taken from annual reports of related office and their websites. So, the major sources and types of data include these published sources such as financial statement of sample development banks, different previous studies and related bulletins, NRB reports, periodically published by various government bodies. Conducting appropriate data gathering instruments helped researchers to combine the strengths and amend some of the inadequacies of any source

of data to minimize risk of irrelevant conclusion. Data is collected from audited financial statements (balance sheet and profit and loss account) of each development bank included in the sample and various journals and publications of NRB etc.

3.4 Method of Analysis

In this study, descriptive analysis, correlation analysis and multiple regressions are applied to examine the impact of liquidity as measured through liquidity variables on profitability of development banks in Nepal.

3.4.1 Descriptive Analysis

Mean ($\bar{X}$)

The total values added to the number of observations in the sample yields the arithmetic mean, often known as the average. It depicts the whole set of data that is situated roughly halfway between the two extremes. An average is commonly referred to as a measure of central tendency because of this. It is calculated as:

$$\text{Mean } (\bar{X}) = \frac{\Sigma X}{n}$$

Where,

$\bar{X}$= Sum of the variables 'X'

n = No. of observations

Standard Deviation

The positive square root of the mean, or the square of the variation taken from the arithmetic mean, is the definition of the standard deviation. Greater standard deviation, the variability will be higher and vice versa. Dispersion quantifies how far the data deviate from the center value. Put differently, it is beneficial to examine the data's quality in terms of its variability. It is calculated as:

$$\text{Standard Deviation (S.D.)} = \sqrt{\frac{\Sigma(X - \bar{X})^2}{n-1}}$$

Co-efficient of Variation

The standard deviation represents the dispersion in absolute terms. The measurement of the coefficient of standard deviation is the relative measure of dispersion depending

on the standard deviation. Coefficient of variation is the percentage measure of co-efficient of so. More homogeneity and consistency with fewer CVs, and vice versa. Standard deviation alone is inappropriate when comparing two sets of data; nevertheless, CV may also compare two variables separately based on their variability. It is calculated as under:

$$\text{Coefficient of Variation (C.V.)} = \frac{\sigma}{\bar{X}} \times 100$$

3.4.2 Correlation Analysis

Among the several mathematical techniques for calculating correlation, Karl Pearson's well-known Pearson's coefficient of correlation is frequently applied in real-world scenarios to gauge the strength of the link between two variables. When a change in one variable's value is accompanied by a change in the other's value, two variables are said to have correlation. As a result, it is calculated using the following formula using two variables. It is denoted by small 'r'.

$$\text{Correlation Coefficient (r)} = \frac{n\Sigma XY - \Sigma X\Sigma Y}{\sqrt{n\Sigma X^2 - (\Sigma X)^2}\sqrt{n\Sigma Y^2 - (\Sigma Y)^2}}$$

Where,

r = coefficient of correlation

ΣXY = Sum of product of two series.

ΣX^2 = Sum of squared in X series

ΣY^2 = Sum of squared in Y series

n = number of years

The value of this coefficient can never be more than + 1 or less than -1. Thus, + 1 and -1 are the limit of this coefficient. The value of r = + 1 implies the correlation between variables is positive and vice- versa. And zero denoted no correlation.

3.4.3 Multiple Regressions Analysis

By fitting a linear equation to observed data, multiple linear regression aims to predict the connection between two or more explanatory factors and a response variable. On this regression analysis, development banks profitability variables (dependent) return on assets (ROA) and return on equity (ROE) will be tested for their relationship with explanatory variables. The explanatory variables are independent variables, which are taken from development banks specific (internal) factors such as cash reserve ratio

(CRR), liquid assets to total assets (LATA), loan to deposit ratio (LDR), capital adequacy ratio (CAR) and bank size (SIZE). Therefore, the following model has been employed for the study of relationship and effect of the study variables.

Model 1: $ROA_{it} = \beta + \beta_1 CRR_{it} + \beta_2 LATA_{it} + \beta_3 LDR_{it} + \beta_4 CAR_{it} + \beta_5 LSIZEit + e_{it}$

Model 2: $ROE_{it} = \beta + \beta_1 CRR_{it} + \beta_2 LATA_{it} + \beta_3 LDR_{it} + \beta_4 CAR_{it} + \beta_5 LSIZEit + e_{it}$

Where:

ROA_{it} = Return on assets of development banks i^{th} for the time period t

ROE_{it} = Return on equity of development banks i^{th} for the time period t

CRR_{it} = Cash reserve ratio of development banks i^{th} for the time period t

$LATA_{it}$ = Liquid asset to total asset ratio of development banks i^{th} for the time period t

LAR_{it} = Loan to deposit ratio of development banks i^{th} for the time period t

CAR_{it} = Capital adequacy ratio of development banks i^{th} for the time period t

$LSIZE_{it}$ = Logarithm of total assets of development banks i^{th} for the time period t

β = The intercept (constant)

β_1, β_2, β_3, β_4 and β_5 = The slope which represents the degree with which finance company profitability changes as the independent variable changes by one-unit variable.

e = error component

3.5 Research Framework and Definition of Variables

From the theoretical and empirical literature reviews, the following conceptual framework of the study is developed by the researcher.

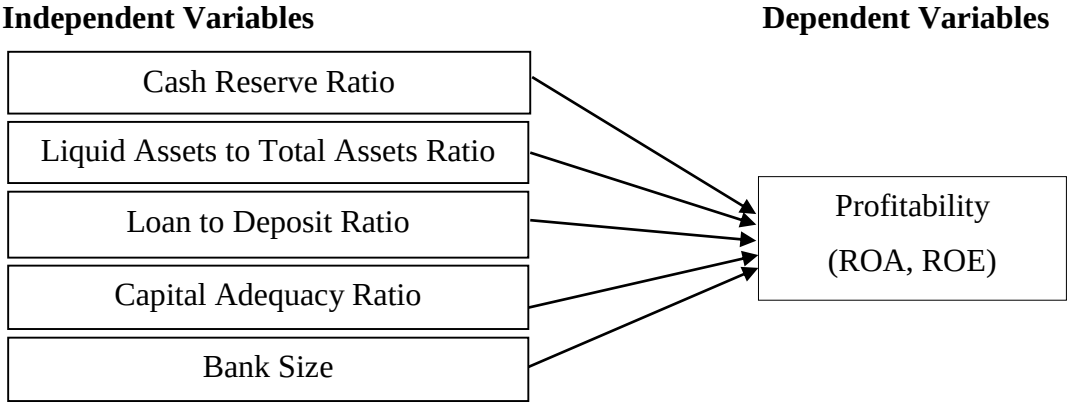

Figure 1: Research Framework

Source: Fagboyo, Adedeju and Adeniran (2018); Bhatt and Verghese (2018); Pokhrel and Pokhrel (2019); Budhathoki et al. (2020) and Ojo et al. (2022)

Definition of Variables

Return on Assets (ROA)

Previous research on profitability and credit risk management revealed that Return on assets (ROA) was a crucial metric for evaluating development banks' financial performance. A financial measure called return on assets (ROA) indicates how much profit (or percentage of return) a business is making relative to its total resources. The return on assets (ROA) of a development bank indicates how profitable its management is able to make use of the bank's assets. Since it shows the returns from the assets that development banks possess, this ratio is perhaps the most significant one for evaluating the effectiveness and operational performance of development banks. It demonstrates how well assets are managed to produce profits. Siraj and Pillai (2012) found that the ratio of net income to total assets measures the return on total assets (ROA) after interest and taxes.

$$\text{Return on assets (ROA)} = \frac{\text{Net Profit}}{\text{Total Assets}}$$

Return on Equity (ROE)

The other metric used to assess profitability success is return on equity. Ratio The other metric used to assess profitability success is return on equity. The most often used internal performance indicator of shareholder value is the ratio of return on equity, or ROE. The amount paid to shareholders on their equity is known as return on equity. Siraj and Pillai (2012) stated that return on equity (ROE) is a metric used to assess a company's profitability that indicates how much profit it makes using the capital that shareholders have contributed. The net income produced expressed as a proportion of shareholders' equity. The net income for the entire fiscal year is calculated after distributions to preferred shares and before dividends paid to common stockholders.

$$\text{Return on equity (ROE)} = \frac{\text{Net Profit After tax}}{\text{Total Equity}}$$

Cash Reserve Ratio (CRR)

A proportion of all customer deposits held with the central bank is the cash reserve ratio. It is one of the tools the reserve bank uses for monetary policy to manage the amount of money in the economy (Abid & Lodhi, 2015). The interest rates, liquidity, and bank profitability are all significantly impacted by this (Teja et al., 2013; Bhattarai,

2014). When a central bank reduces the CRR, there is an increase in the amount of money available in development banks, which results in a fall in interest rates and an increase in profitability as more money is available for funding and generates higher interest profits. Conversely, if CRR rises, less funds are accessible to development banks, which implies that there is less money available for loans, which lowers interest income and lowers profitability. The availability and lack of funds in development banks will be a function of the CRR's rise and decline, indicating the banks' liquidity position. The ratio of cash and bank balance to total deposit was used to calculate liquidity in this case. Reduced risk to the company is indicated by a higher liquidity ratio. It also says that if this ratio is larger, the organization's profitability would be lower.

$$\text{Cash reserve ratio (CRR)} = \frac{\text{Cash and Bank Balance}}{\text{Total Deposit}}$$

Liquid Assets to Total Assets (LATA)

The ratio of liquid assets to total assets is determined by this ratio. As a proportion of all development bank assets, liquid assets comprise cash and equivalents as well as cash reserve at the central bank, short-term deposits in development banks, and other government and nongovernment backed securities. The acid liquid ratio may be divided by the total assets to get the liquid ratio. One kind of risk that development banks face is liquidity risk; if they have fewer liquid assets on hand, they are more susceptible to significant deposit withdrawals. As a result, the ratio of liquid assets to deposits and liquid assets to total assets is used to measure liquidity risk. Profitability and liquidity ratio were found to be negatively correlated (Pasiouras & Kosmidou, 2007). Zidan (2020) found a negative relationship between liquidity and bank profitability.

$$\text{Liquid assets to total assets ratio (LATA)} = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

Loan to Deposit Ratio (LDR)

In order to continue its regular business activities, a lending institution that takes deposits has to maintain a particular level of liquidity. Most of the loans it makes to its clients aren't regarded as liquid, therefore they're investments that take longer to mature. To guarantee that any necessary funds may be obtained quickly, development banks may decide to retain a portion of their non-lending investments in short-term securities

in addition to the minimum required reserves. One measure of liquidity risk is the credit to deposit ratio (LDR). For a development bank, the risk of loss stemming from the incapacity to fulfill its funding requirements is known as the liquidity risk (Lartey et al., 2013). It concerns the development bank's balance between deposits and loans, or the amount coming in vs the amount going out. As long as the loans are used to secure debtors, the more money the development bank has given out yields higher interest revenue. Deposits represent the development bank's obligations to the depositors. Accordingly, a sound development bank has a large number of safe loans that bring in a large amount of money (interest) to fund depositor accounts (Gijaw et al., 2015).

$$\text{Loans and advance to total deposit ratio} = \frac{\text{Loans and advance}}{\text{Total Deposit}}$$

Capital Adequacy Ratio (CAR)

Capital ratios show how resilient financial organizations are to shocks. These ratios show which issues are now present. Problems with capital sufficiency and increased risk exposure might result from negative developments in these ratios. The equity/total assets ratio, or CAR, was employed in this study to gauge capital adequacy. Stated differently, the development bank's capital strength or solvency is shown by this equity metric in relation to total assets (Bhatt & Verghese, 2018). The development bank is more reliable and effective when the ratio is higher. Although this variable's link to profitability may change depending on the stage of the business cycle, it is anticipated that it will generally have a positive association with profitability (Budhathoki et al., 2020).

$$\text{Capital adequacy ratio (CAR)} = \frac{\text{Total Equity}}{\text{Total Assets}}$$

Bank Size (SIZE)

The natural logarithm of total assets is the bank's size. Because it affects the bank's performance, bank size has been included as a bank-specific internal independent variable in this study. Performance has a good or negative relationship. If managing a bank becomes more challenging as its size increases. Conversely, it has determined that because of the economies of scale that come with size, banks of a larger size may raise capital at a cheaper cost.

CHAPTER - IV
RESULTS AND DISCUSION

The major objective of this study is to investigate the impact of liquidity on profitability of development banks in Nepal. The first section presented structure of variables, descriptive, correlation analysis and regression analysis on variables of the study; the second section presented discussions of the findings for the study. The data were analyzed by the aid of the statistical software SPSS version 23.

4.1 Results

In this section, analysis of the impact of liquidity on future profitability of sample is carried out using the statistical analytical tools such as descriptive statistic, correlations analysis and multiple regression analysis.

4.1.1 Analysis of Descriptive Statistics

The descriptive statistics of dependent variables profitability (ROA and ROE) and independent variables (cash reserve ratio, liquid assets ratio, loan to deposit ratio, capital adequacy ratio and bank size) of the study is shown in Table 4.8. The descriptive statistics used in this study includes mean, standard deviation, minimum and maximum value of variables, scale and N represent the number of the observations.

Table 2

Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	SD
CRR	30	3.10	9.74	5.5043	1.65680
LATA	30	7.24	29.29	20.6683	6.43369
LDR	30	76.74	90.37	83.6523	3.41490
CAR	30	11.19	30.60	15.3130	4.30781
LSIZE	30	3.53	5.08	4.3120	0.46757
ROA	30	0.94	2.79	1.6517	0.51451
ROE	30	6.94	26.88	15.6190	5.07654

Source: Appendix - II

Table 2 reveals a summary of the descriptive statistics of two response variables: ROA and ROE; five predictor variables like cash reserve ratio, liquid assets ratio, loan to

deposit ratio, capital adequacy ratio and bank size are used in the study. At first, the mean of cash reserve ratio (CRR) is 5.5043 with standard deviation of 1.65680 and ranges from 3.10 to 9.74 percent. The average liquid assets to total assets ratio is 20.6683 percent and standard deviation of 6.43369 over the study period with the maximum ratio at 29.29 percent and the minimum this ratio is 7.24 percent. The another independent variables loan to deposit ratio shows that this ratio varies from a minimum of 76.74 percent to a maximum of 90.37 percent with an average of 83.6523 percent and standard deviation of 3.41490. The fourth independent variable CAR, higher the value of capital ratio, better the safety for the depositors because shareholder's equity provides a buffer against adversity. CAR ranged from 11.19 to 30.60 percent respectively. Then, the average CAR is 4.3120 percent and the standard deviation is low i.e. 0.46757. On the control variable, the bank size has a range from 3.53 to 5.08 and mean of 4.3120. It reveals that the average bank size of development banks in Nepal during the study period is bigger.

The summary of ROA shows that the average return on assets over the study period is 1.6517 percent and standard deviation of 0.51451, the maximum return on assets is 2.79 percent and the minimum of 0.94 percent. The return on assets shows how efficient the banks are using its assets to generate profit measured by profit before interest and tax divided by total assets. ROE mean is 15.6190 percent from the range to minimum 6.94 to maximum 26.88 percent, which is satisfactory since it is between ROE 15 to 25 or average. Then, standard deviation for ROE is 5.07654.

4.1.2 Correlation Analysis

Correlation analysis is a statistical tool which studies the relationship between liquidity and profitability variables. In this study correlation analysis is used to identify the relationship of liquidity as CRR, LATA, LDR, CAR and SIZE with profitability as ROA and ROE of development banks in Nepal.

Table 3

Correlation Analysis

	CRR	LATA	LDR	CAR	LSIZE	ROA	ROE
CRR	1						
LATA	.411*	1					
LDR	.192	-.190	1				
CAR	-.011	.452*	.104	1			
LSIZE	-.462*	-.864**	.077	-.237	1		
ROA	.778**	.481**	.368*	-.015	-.601**	1	
ROE	.598**	-.018	.232	-.577**	-.191	.754**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Appendix - III

Table 3 reveals the correlation matrix of response and predictor variables. Correlation result shows cash reserve ratio has significant positive correlation with ROA and ROE. Similarly, liquid assets to total assets ratio has significant positive correlation with ROA but insignificant negative relationship with ROE. The correlation analysis also shows that there is significant positive relationship between ROA and loan to deposit ratio (LDR) and LDR has insignificant positive relation with ROE. At the same time, capital adequacy ratio (CAR) has insignificant negative correlation with ROA but it has significant negative relation with ROE at 1 percent level. Moreover, correlation of bank size has also significant negative relationship with ROA and insignificant negative relationship with ROE.

4.1.3 Regression Analysis

In coefficient analysis, two or more independent variables are used to estimate the value of dependent variables whereas in the simple regression analysis single independent variable is used to estimate the values of a dependent variable. Multiple regression analysis helps to know relative movement in the variable. To estimate the relationship between liquidity and profitability, the theoretical statement of the model is that the ROA and ROE would depend on cash reserve ratio, liquid assets ratio, loan to deposit ratio, capital adequacy ratio and bank size. The theoretical statements farmed above may be stated as,

Regression Analysis between Independent Variables and ROA

Return on assets is the dependent variable and independent variables are cash reserve ratio, liquid assets ratio, loan to deposit ratio, capital adequacy ratio and bank size to analyze the impact of liquidity on profitability of the banks.

Table 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.884[a]	.781	.735	.26481

a. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA
b. Dependent Variable: ROA
Source: Appendix - IV

Table 4 shows the adjusted R square value is 0.735 in the models denote that 73.50 percent of the observed variability in return on assets can be explained by the differences in the independent variables. Remaining 26.50 percent of the variance in preference is related to other variable which did not explain, because they are not depicted in the model. The R-Square which is also a measure of the overall fitness of the model indicates that the model is capable of explaining about 78.10 percent of the variability in the ROA of banks. In this study, the R statistic is 0.884, indicated that there is high degree of relationship between study variables. This implies that the ROA was highly influenced by its independent variables. Standard error of estimate is flawlessly associated with regression analysis due to small value.

Table 5

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.994	5	1.199	17.094	.000[b]
	Residual	1.683	24	.070		
	Total	7.677	29			

a. Dependent Variable: ROA
b. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA
Source: Appendix - IV

Table 5 shows ANOVA analysis results which depicts the overall regression model fitness for the data. It showed p-value of 0.000 which is less than 0.05 this indicates that liquidity predicts the profitability (ROA) considerably.

Table 6

Regression Coefficients for dependent variable ROA

Variables	Coefficients	t-statistics	p-value	Collinearity Statistics	
				Tolerance	VIF
(Constant)	-2.223	-1.074	.294		
CRR	.156	4.293	.000	.670	1.494
LATA	.015	.769	.450	.155	6.459
LDR	.053	3.163	.004	.748	1.337
CAR	-.024	-1.585	.126	.589	1.699
LSIZE	-.310	-1.339	.193	.207	4.841

Source: Appendix - IV

Table 6 presents the regression coefficient of independent variables cash reserve ratio, liquid assets ratio, loan to deposit ratio, capital adequacy ratio and bank size of the development banks and the intercept value of dependent variable ROA. The multiple regression analysis found that the coefficient of regression (β) 0.156 for CRR. It indicates that if CRR increased by one percent then ROA increased by 0.156 percent and the p value of cash reserve ratio (CRR) is 0.000 reveals that it is statistically significant at 5 percent level of significance. Hence, this is significant positive effect of CRR on ROA of the banks.

The coefficient of regression (β) is 0.015 for LATA. It indicates that if LATA increased by one percent then ROA increased by 0.015 percent and the p value of liquid assets to total assets (LAR) is 0.450 reveals that it is statistically insignificant at 5 percent level of significance. Hence, this is insignificant positive effect of LATA on ROA. Similarly, the coefficient of regression (β) is 0.053 for loan to deposit ratio (LDR). It indicates that if LDR increased by one percent then ROA increased by 0.053 percent and the p value of LDR is 0.004 reveals that it is statistically significant at 5 percent level of significance. Hence, LDR has significant positive impact on ROA of the banks. However, the coefficient of regression (β) is -0.024 for CAR. It indicates that if CAR increased by one percent then ROA decreased by 0.024 percent and the p value of CAR is 0.126 discloses that it is statistically insignificant at 5 percent level of significance. This means CAR has insignificant negative impact on ROA of sample banks. Finally, the coefficient of regression (β) is -0.310 for LSIZE. It indicates that if LSIZE increased by one percent then ROA decreased by -0.310 percent and the p value of LSIZE is

0.193 discloses that it is statistically insignificant at 5 percent level of significance. This means LSIZE has insignificant negative impact on ROA of sample development banks.

Regression Analysis between Independent Variables and ROE

Return on equity is the dependent variable and independent variables are cash reserve ratio, liquid assets ratio, loan to deposit ratio, capital adequacy ratio and bank size to analyze the impact of liquidity on profitability of the banks.

Table 7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853[a]	.728	.672	2.90919

a. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA
b. Dependent Variable: ROE
Source: Appendix - V

Table 7 shows the adjusted R square value is 0.672 in the models denote that 67.20 percent of the observed variability in ROE can be explained by the differences in the independent variables. Remaining 32.80 percent of the variance in preference is related to other variable which did not explain, because they are not depicted in the model. R square values of 0.728 percent indicate that 72.80 percent independent variables are explained in the dependent variables. This indicates significance of overall model. In this study, the R statistic is 0.853, indicated that there is high degree of relationship between study variables. This implies that the ROE was highly influenced by its independent variables. Standard error of estimate is flawlessly associated with regression analysis due to small value.

Table 8

ANOVA Table

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	544.247	5	108.849	12.861	.000[b]
	Residual	203.121	24	8.463		
	Total	747.368	29			

a. Dependent Variable: ROE
b. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA
Source: Appendix - V

Table 8 presents ANOVA analysis results which depicts the overall regression model fitness for the data. It showed p-value of 0.000 which is less than .05 this indicates that independent variables predicts the ROE considerably.

Table 9

Regression Coefficients for dependent variable ROE

Variables	Coefficients	t-statistics	p-value	Collinearity Statistics	
				Tolerance	VIF
(Constant)	1.616	.071	.944		
CRR	1.522	3.818	.001	.670	1.494
LATA	-.041	-.192	.849	.155	6.459
LDR	.302	1.650	.112	.748	1.337
CAR	-.718	-4.392	.000	.589	1.699
LSIZE	-1.804	-.710	.485	.207	4.841

Source: Appendix-V

Table 9 presents the regression coefficient of independent variables cash reserve ratio, liquid assets ratio, loan to deposit ratio, capital adequacy ratio and bank size of the development banks and the intercept value of dependent variable ROE. The multiple regression analysis found that the coefficient of regression (β) is 1.522 for CRR. It indicates that if CRR increased by one percent then ROA increased by 1.522 percent and the p value of cash reserve ratio (CRR) is 0.001 reveals that it is statistically significant at 5 percent level of significance. Hence, this is significant positive effect of CRR on ROE of the banks. The coefficient of regression (β) is -0.041 for LATA. It indicates that if LATA increased by one percent then ROE decreased by 0.041 percent and the p value of liquid assets to total assets (LAR) is 0.849 reveals that it is statistically insignificant at 5 percent level of significance. Hence, this is insignificant negative effect of LATA on ROE.

Similarly, the coefficient of regression (β) is 0.302 for loan to deposit ratio (LDR). It indicates that if LDR increased by one percent then ROE increased by 0.302 percent and the p value of LDR is 0.112 reveals that it is statistically insignificant at 5 percent level of significance. Hence, LDR has insignificant positive impact on ROE of the banks. However, the coefficient of regression (β) is -0.718 for CAR. It indicates that if CAR increased by one percent then ROE decreased by -0.718 percent and the p value of CAR is 0.000 discloses that it is statistically significant at 5 percent level of

significance. This means CAR has significant negative impact on ROE of sample banks. Finally, the coefficient of regression (β) is -1.804 for LSIZE. It indicates that if LSIZE increased by one percent then ROE decreased by -1.804 percent and the p value of LSIZE is 0.485 discloses that it is statistically significant at 5 percent level of significance. This means LSIZE has insignificant negative impact on ROE of sample development banks.

4.2 Discussion

The main purpose of this study is to examine the impact of liquidity on profitability of development banks in Nepal. Liquidity has a direct impact on assets and returns on equity, the two main parameters for measuring profitability of the development banks.

Correlation result shows that cash reserve ratio (CRR) is positively related to return on assets. This indicates that higher the cash reserve ratio higher would be the return on assets and statistically significant positive relationship in 5 percent level of significance. Similarly, CRR is significant positively related to ROE. An insignificant and positive association between CRR and ROE was found in the previous study of Pokhrel and Pokhrel (2019).

Similarly, liquid assets to total assets has significant positive correlation with ROA but insignificant negative relationship with ROE. This study is similar with the previous study of Bhatt and Verghese (2018); Saleh et al. (2020) and Pradhan and Shrestha (2016) which observed that liquid assets ratio have positive relationship with ROA.

Then, there is significant positive relationship between loan to deposit ratio (LDR) and ROA which is consistent with the findings of Khati (2020); Swain and Mishra (2020); Ibrahim (2017) which observed that LDR has positive relationship with ROA but it contradicts with the findings of Kajola et al. (2019) and LDR has also positive and insignificant relation with ROE. This result is not similar with the prior study of Mohanty and Mehrotra (2019); Khati (2020).

At the same time, capital adequacy ratio (CAR) has insignificant negative correlation with ROA. A negative association of these variables has been found in previous study

Bhatt and Verghese (2018) but opposite to the finding of Budhathoki et al. (2020); Zidan (2020) but it has negative significant relation with ROE at 1 percent level.

Moreover, correlation of bank size has also significant negative relationship with ROA and insignificant negative relationship with ROE. This is consistent with the findings of Saleh, Afifa and Murray (2020). However, it contradicts with the findings of Budhathoki et al. (2020); Kajola et al. (2019).

Results obtained from regression analysis, cash reserve ratio (CRR) has positive and significant impact on ROA which is similar with the previous study of Ojo et al. (2022). However, it contradicts with the finding of Pokhrel and Pokhrel (2019); Wuave et al. (2020) concluded that cash reserve ratio has negative impact on ROA of the development banks.

Then, liquid assets have positive and insignificant impact on ROA. This result is similar to the result of Al-Husainy and Jadah (2021) and Nourrein and Mennawi (2020) but it does not consistent with the findings of Zidan (2020).

Then, loan to deposit ratio has positive and significant impact on ROA at 5 percent level means the more money the sample banks has loaned out generates more interest income provided the loans are to borrowers which is consistent with the findings of prior empirical studies of Zidan (2020); Ojo et al. (2022) but contradicts with the results of Bhatt and Verghese (2018); Budhathoki et al. (2020); Khati (2020); Wuave et al. (2020); Swain and Mishra (2020) mentioned that loan to deposit ratio has negative effect on ROA.

However, capital adequacy ratio has insignificant negative impact on ROA of the development banks which is not consistent with the findings Budhathoki et al. (2020); Zidan (2020).

Finally, bank size has insignificant negative impact on ROA of the banks. This finding is not similar with the researcher expectation a large size of banks diseconomies of scale that large banks can difficult to manage it. This is consistent with Saleh et al. (2020) but it contradicts with the findings of Kajola et al. (2019).

As regards regression in ROE, cash reserve ratio (CRR) has positive and significant impact on ROE at 5 percent level of significance. Higher percentage of cash reserve ratio shows the greater liquidity position of the banks and low risk of technical insolvency and vice-versa but this finding is consistent with the findings of Wuave et al. (2020) which observed that cash reserve ratio has insignificant effect on ROE. However, it contradicts with the prior study of Pokhrel and Pokhrel (2019).

Then, liquid assets to total assets ratio has negative and insignificant impact on ROE at 5 percent level of significance. This result is consistent with the results identified by Saleh et al. (2020) but it does not consistent with the findings of Al-Husainy and Jadah (2021).

At the same time, loan to deposit ratio has positive and insignificant impact on ROE at 5 percent level which is consistent with the findings of prior empirical studies of Swain and Mishra (2020); Rudhani and Balaj (2019); but it contradicts with the findings of Mohanty and Mehrotra (2019); Budathoki et al. (2020); Wuave et al. (2020).

However, capital adequacy ratio has significant negative impact on ROE of the banks which is consistent with the findings of Budhathoki et al. (2020) which observed that capital adequacy ratio has negative impact on ROE of the banks.

Finally, bank size has insignificant negative impact on ROE of the banks, supporting the findings of Saleh et al. (2020) but does not consistent with the results of Swain and Mishra (2020) and Budathoki et al. (2020).

CHAPTER - V
SUMMARY AND CONCLUSION

5.1 Summary

There are two main ways to define liquidity management. The first one talks about trading various kinds of assets at the market price. Financial institutions use additional criteria, such as the ability to pay cash and collateral obligations without suffering a large loss. A competent manager works to lower the risk of liquidity, which results in organizational liquidity management. Financial statements are used by banks to assess liquidity risk through the use of liquidity measurement ratios. When making financial management decisions, liquidity management is essential. In development banks, liquidity is the ability to meet short-term financial obligations, and optimization of liquidity may be accomplished via managing the trade-off between profitability and liquidity. Liquidity is a necessary component of effective bank management as it enables banks to run smoothly and provides the fast cash or assets needed to cover short-term commitments.

The main objective of this study is to evaluate the impact of liquidity on profitability of development banks in Nepal. The other specific objectives are to analyze the existing position of development banks liquidity and profitability indicators, to examine the relationship between liquidity and profitability of Nepalese development banks and to examine the impact of development banks liquidity on the profitability in the case of development banks in Nepal. To achieve the specific objective of the study, descriptive and causal comparative research design has been carried out. Descriptive design is used to analyze the pattern and status of profitability and liquidity. Causal comparative research design is used to measure the impact of liquidity on profitability of banks in Nepal. Currently, there are 16 development banks in Nepal. In this study, all the development banks are population of the study among them three development banks have been selected as sample because these banks are top four in terms of profitability in last couple of years. The sample banks of the study are Jyoti Bikash Bank Limited, Muktinath Bikas Bank Limited and Garima Bikas Bank Limited. To conduct this study, secondary data are taken from annual reports of related office and their websites. In order to analyze the liquidity variables and its impact on

profitability, computed ratios for four sample banks for ten consecutive years.i.e. from 2012/13 to 2021/22 were collected from an audited financial report of sample development banks were collected for the same years.

This study found that there is strong liquidity position of development banks in form of cash reserve ratio, liquid assets ratio and loan to deposit ratio. The profitability ratios (ROA and ROE) are main indicators to analyzing the profitability of sample development banks. In this study, sample banks have efficiently utilized its assets through mobilizing its deposit because they have high ratios. The correlation analysis shows that cash reserve ratio has significant positive correlation with ROA and ROE. Similarly, liquid assets to total assets ratio has significant positive correlation with ROA but insignificant negative relationship with ROE. The correlation analysis also shows that there is significant positive relationship between ROA and loan to deposit ratio (LDR) and LDR has insignificant positive relation with ROE. At the same time, capital adequacy ratio (CAR) has insignificant negative correlation with ROA but it has significant negative relation with ROE. Moreover, correlation of bank size has also significant negative relationship with ROA and insignificant negative relationship with ROE. The multiple regression analyses revealed that cash reserve ratio has significant positive impact on profitability (ROA and ROE) of the banks. At the meantime, liquid assets to total assets ratio has insignificant positive impact on ROA and insignificant negative impact on ROE. However, loan to deposit ratio has significant positive impact on ROA and insignificant positive impact on ROE. Moreover, capital adequacy ratio has insignificant negative impact on ROA and it has significant negative impact on ROE of the development banks. Moreover, bank size has insignificant negative impact on profitability of the development banks.

5.2 Conclusion

This descriptive analysis in this study conclude that banks have strong liquidity position in term of cash reserve ratio, liquid assets to total assets ratio and loan to deposit ratio since there is higher liquidity in the banks making secured position for short-term. The profitability as ROA and ROE of the banks indicate that banks have efficiently utilized its assets through mobilizing its deposit because they have higher prafitability ratios.

The relationship analysis conclude that that cash reserve ratio has significant positive correlation with ROA and ROE, which means banks are able to utilize the deposits in earning sector maintain the reserve requirement as per the NRB guidelines. Similarly, liquid assets to total assets ratio has significant positive correlation with ROA but insignificant negative relationship with ROE, meaning that maintaining higher liquid assets reserve makes less utilization of fund and can affect earnings negatively. The correlation analysis also shows that there is significant positive relationship between ROA and loan to deposit ratio (LDR) and LDR has insignificant positive relation with ROE, which indicates that increasing loan ratio also increases the interest regular earnings and profitability of the banks. At the same time, capital adequacy ratio (CAR) has insignificant negative correlation with ROA but it has significant negative relation with ROE, which means that the increased capital should be used in the earning sectors. Moreover, correlation of bank size has also significant negative relationship with ROA and insignificant negative relationship with ROE, which denotes that only increasing banks size cannot increase the profitability and also the larger size of the banks increases the competition in the market.

The regression analysis concluded that cash reserve ratio has significant positive impact on profitability (ROA and ROE) of the banks. At the meantime, liquid assets to total assets ratio has insignificant positive impact on ROA and insignificant negative impact on ROE. However, loan to deposit ratio has significant positive impact on ROA and insignificant positive impact on ROE. Moreover, capital adequacy ratio has insignificant negative impact on ROA and it has significant negative impact on ROE of the development banks. Moreover, bank size has insignificant negative impact on profitability of the development banks.

5.3 Implications

Based on the findings of the research the following implications were given:

- Analysis shows that liquidity significantly affects profitability in terms of the cash reserve ratio, loan to deposit ratio, and capital adequacy ratio. As a result, the information and conclusions encourage policymakers, regulators, and bank management to take appropriate action.

- According to the study, which takes into account the many aspects of bank liquidity and how it affects banks' profitability, effective management of liquidity would help not just bankrupt individuals and businesses, but also individuals and businesses in general. Consequently, this enhances the welfare of the financial industry within the economy and the community at large.
- This study is noteworthy because it addresses the biggest financial risks that Nepalese banks encounter in both their operational and long-term cycles. Additionally, the study can help policy and decision-makers in Nepal's financial sector manage the risks stated above.
- This study can provide some of the most recent information, statistics, and challenges related to liquidity. Therefore, bankers, stockholders, depositors, as well as future scholars and students, will find this study to be relevant. The study's conclusions are beneficial to investors and future researchers. This paper is a valuable resource for future researchers.
- This study makes implications that are helpful for further researchers and investors. This study also useful for further researcher as a source.

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APPENDICES

APPENDIX – I

Data of Development Banks

Banks	Year	CRR	LATA	LDR	CAR	SIZE	ROA	ROE
JBBL	2012/13	5.54	26.74	83.95	21.85	4901.93	1.43	8.28
JBBL	2013/14	4.57	27.10	80.65	18.43	6194.76	1.01	6.94
JBBL	2014/15	5.28	28.70	78.27	17.05	7423.09	1.39	10.24
JBBL	2015/16	5.36	27.27	76.74	16.76	8917.85	1.70	13.13
JBBL	2016/17	5.35	26.17	85.36	30.6	13188.43	1.73	8.95
JBBL	2017/18	5.16	26.73	79.90	19.25	23401.93	1.48	10.99
JBBL	2018/19	4.32	20.66	84.24	16.27	36459.94	1.46	13.26
JBBL	2019/20	3.74	18.75	82.46	15.08	42361.1	1.15	10.84
JBBL	2020/21	3.1	9.26	86.11	13.04	59879.02	1.11	12.66
JBBL	2021/22	3.23	15.63	89.00	12.74	71407.87	0.94	11.89
MNBBL	2012/13	8.06	29.29	81.86	12.14	4423.2	2.22	24.60
MNBBL	2013/14	6.64	24.26	84.22	12.52	6029.44	2.52	25.17
MNBBL	2014/15	7.95	24.17	85.14	13.17	9000.47	2.42	22.39
MNBBL	2015/16	8.49	20.64	86.89	12.28	12936.75	2.79	26.88
MNBBL	2016/17	9.74	19.41	90.37	14.71	19592.34	2.49	21.27
MNBBL	2017/18	5.34	24.03	82.07	14.2	34766.24	1.79	17.21
MNBBL	2018/19	6.49	18.72	81.55	13.44	51991.4	1.65	19.24
MNBBL	2019/20	7.58	14.89	80.93	13.23	66348.09	1.07	12.16
MNBBL	2020/21	4.72	7.24	82.76	11.19	101131.72	1.14	16.93
MNBBL	2021/22	4.59	8.83	82.58	11.8	121083.27	1.11	16.61
GBBL	2012/13	5.87	27.30	79.91	12.13	3390.93	1.80	19.25
GBBL	2013/14	5.68	22.89	86.12	13.36	4612.39	2.26	19.90
GBBL	2014/15	5.42	24.81	85.52	12.97	7452.36	1.94	14.81
GBBL	2015/16	6.22	22.64	85.70	14.13	10578.84	2.10	18.47
GBBL	2016/17	6.22	24.29	88.44	24.99	17662.11	1.98	12.34
GBBL	2017/18	5.87	22.30	87.74	18.84	25237.5	1.75	13.95
GBBL	2018/19	4.06	19.59	85.83	14.44	38749.11	1.53	15.68
GBBL	2019/20	3.94	17.35	77.77	13.87	50293.65	1.15	13.28
GBBL	2020/21	3.46	10.70	81.05	11.43	72947.56	1.15	15.64
GBBL	2021/22	3.14	9.69	86.44	13.48	80030.53	1.29	15.61

(Source: Annual Report of JBBL, MNBBL & GBBL form 2012/13 to 2021/22)

APPENDIX -II

Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
CRR	30	3.10	9.74	5.5043	1.65680
LATA	30	7.24	29.29	20.6683	6.43369
LDR	30	76.74	90.37	83.6523	3.41490
CAR	30	11.19	30.60	15.3130	4.30781
LSIZE	30	3.53	5.08	4.3120	.46757
ROA	30	.94	2.79	1.6517	.51451
ROE	30	6.94	26.88	15.6190	5.07654
Valid N (listwise)	30				

(Source: SPSS version 23)

APPENDIX -III

Pearson Correlation Coefficients

		CRR	LATA	LDR	CAR	LSIZE	ROA	ROE
CRR	Pearson Correlation	1	.411*	.192	-.011	-.462*	.778**	.598**
	Sig. (2-tailed)		.024	.309	.955	.010	.000	.000
	N	30	30	30	30	30	30	30
LATA	Pearson Correlation	.411*	1	-.190	.452*	-.864**	.481**	-.018
	Sig. (2-tailed)	.024		.315	.012	.000	.007	.924
	N	30	30	30	30	30	30	30
LDR	Pearson Correlation	.192	-.190	1	.104	.077	.368*	.232
	Sig. (2-tailed)	.309	.315		.583	.687	.045	.218
	N	30	30	30	30	30	30	30
CAR	Pearson Correlation	-.011	.452*	.104	1	-.237	-.015	-.577**
	Sig. (2-tailed)	.955	.012	.583		.208	.936	.001
	N	30	30	30	30	30	30	30
LSIZE	Pearson Correlation	-.462*	-.864**	.077	-.237	1	-.601**	-.191
	Sig. (2-tailed)	.010	.000	.687	.208		.000	.312
	N	30	30	30	30	30	30	30
ROA	Pearson Correlation	.778**	.481**	.368*	-.015	-.601**	1	.754**
	Sig. (2-tailed)	.000	.007	.045	.936	.000		.000
	N	30	30	30	30	30	30	30
ROE	Pearson Correlation	.598**	-.018	.232	-.577**	-.191	.754**	1
	Sig. (2-tailed)	.000	.924	.218	.001	.312	.000	
	N	30	30	30	30	30	30	30

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

(Source: SPSS version 23)

APPENDIX -IV

Multiple Regression Analysis of Sample Banks (In ROA)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.884[a]	.781	.735	.26481

a. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.994	5	1.199	17.094	.000[b]
	Residual	1.683	24	.070		
	Total	7.677	29			

a. Dependent Variable: ROA

b. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.223	2.070		-1.074	.294		
	CRR	.156	.036	.501	4.293	.000	.670	1.494
	LATA	.015	.019	.187	.769	.450	.155	6.459
	LDR	.053	.017	.350	3.163	.004	.748	1.337
	CAR	-.024	.015	-.197	-1.585	.126	.589	1.699
	LSIZE	-.310	.231	-.282	-1.339	.193	.207	4.841

a. Dependent Variable: ROA

(Source: SPSS version 23)

APPENDIX -V

Multiple Regression Analysis of Sample Banks (In ROE)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.853[a]	.728	.672	2.90919

a. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	544.247	5	108.849	12.861	.000[b]
	Residual	203.121	24	8.463		
	Total	747.368	29			

a. Dependent Variable: ROE

b. Predictors: (Constant), LSIZE, LDR, CAR, CRR, LATA

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.616	22.742		.071	.944		
	CRR	1.522	.398	.497	3.818	.001	.670	1.494
	LATA	-.041	.213	-.052	-.192	.849	.155	6.459
	LDR	.302	.183	.203	1.650	.112	.748	1.337
	CAR	-.718	.163	-.609	-4.392	.000	.589	1.699
	LSIZE	-1.804	2.542	-.166	-.710	.485	.207	4.841

a. Dependent Variable: ROE

(Source: SPSS version 23)

RELATIONSHIP BETWEEN LIQUIDITY AND PROFITABILIT...

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