

DETERMINANTS OF LIQUIDITY OF COMMERCIAL BANKS OF NEPAL

A Dissertation Submitted to the Office of the Dean, Faculty of Management in partial fulfillment of the requirements for the Master's Degree

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CERTIFICATE OF AUTHORSHIP

I hereby corroborate that I have researched and submitted the final draft of dissertation entitled “**Determinants of Liquidity in Commercial Bank of Nepal**”. The work of this dissertation has not been submitted previously for the purpose of conferred of any degree nor has it been proposed and presented as part of requirements for any other economic purpose.

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

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LIST OF ABBREVIATIONS

AD	-	Anna Domine
ADB/N	-	Agriculture Development Bank; Nepal
BS	-	Bikram Sambat
CAR	-	Capital Adequacy Ratio
CD Ratio	-	Credit Deposit Ratio
CSI	-	Cottage and Small Scale Industries
CV	-	Coefficient of Variation
G/N	-	Government of Nepal
GDP	-	Gross Domestic Product
i.e.	-	That is
IC	-	Indian Currency
IMF	-	International Monetary Fund
INF	-	Inflation
LC	-	Letter of Credit
NBL	-	Nepal Bank Limited
NC	-	Nepalese Currency
NIDC	-	Nepal Industrial Development Corporation
NPLs	-	Non-performing Loans
NRB	-	Nepal Rastra Bank
r	-	Correlation coefficient
RBB	-	Rastriya Banijya Bank
TA	-	Total Assets
BFI	-	Bank and Financial Institutions
TU	-	Tribhuvan University
Viz.	-	Namely

ABSTRACT

As liquidity problems of some banks during global financial crisis re-emphasized, liquidity is very important for functioning of financial markets and the banking sector. The aim of this study is therefore to identify determinants of liquidity of Nepali commercial banks. The data cover the period from 2010 to 2020. In this study liquidity is dependent variable and capital adequacy ratio (CAR), share of non-performing loan (SoNPL), deposit amount, GDP and inflation are independent variables. More specifically study have used two model for this study L_1 (liquidity/total assets) and L_2 (liquidity/deposit + borrowing) model, as used by volvoda. Accordance to L_1 model, the results of panel data regression analysis showed that capital adequacy ratio (CAR), share of non-performing loan (SoNPL) and GDP have significant but CAR and SoNPL only have positive impact to determine liquidity and GDP have inverse relation. Bank size, deposit and inflation rate have insignificant but only bank size and inflation rate have positive impact to determine liquidity level and deposit amount have inverse relation. Accordance to L_2 model, the results of panel data regression analysis showed that CAR, bank size, deposit amount and GDP have significant relation in determining liquidity level. Among of them CAR and bank size have positive relation with liquidity level but deposit amount and GDP have negative relation. SoNPL and Inflation rate both have insignificant and positive relation with liquidity level in the commercial bank of Nepal.

CHAPTER I INTRODUCTION

1.1 Background of the study

Financial sector is the backbone of economy of a country. It works as a facilitator for achieving sustained economic growth through providing efficient monetary intermediation. A strong financial system promotes investment by financing productive business opportunities, mobilizing savings, efficiently allocating resources and makes easy the trade of goods and services. Several studies have reported that the efficacy of a financial system to reduce information and transaction costs plays an important role in determining the rate of savings, investment decisions, technological innovations and hence the rate of economic growth. There are various factors that positively or negatively affects to success of various organizations, so as to commercial banks, among of them managing appropriate level of liquidity level have core importance.

“Liquid asset means the cash balance of a bank or financial institution, the balance remained in the current account, the balance maintained in Rastra Bank and such assets of a bank or financial institution specified as liquid assets by the Rastra Bank from time to time.” (Bank and Financial Institution Act, 2017).

Liquidity for a bank means the ability to meet its financial obligations as they come due. Bank lending finances investments in relatively illiquid assets, but it funds its loans with mostly short term liabilities. Thus one of the main challenges to a bank is ensuring its own liquidity under all reasonable conditions. A bank's liquidity is determined by its ability to meet all its anticipated expenses, such as funding loans or making payments on debt, using only liquid assets. The attention has been paid by lender to the last resort to overcome the liquidity crisis (Aspachs, et. Al. Nier, Tiesset, 2005).

Bank for International Settlements defines liquidity as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. The management of any firm should be able to identify its strength and weakness, likewise exploit opportunities and tackle threats as it is determined to make profits.

Liquidity can be defined as the ability of a financial institution to meet all legitimate demands for funds. A bank needs to hold liquid assets to meet the cash requirements of its customers if the institution does not have the resources to satisfy its customers' demand, then it either has to borrow on the inter-bank market or the central bank. If bank unable to meet its customers' demands leaves itself exposed to a run and more importantly, a systemic lack of confidence in the banking system (Yeager and Seitz, 1989).

Liquidity means allocation of funds in close relation to their respective sources. Liquidity is the status and part of the assets which can be used to meet the obligation in the commercial banks. Liquidity can be viewed in terms of liquidity stored in the balance sheet and in terms of liquidity available through purchased funds. Liquidity is the ability of a bank to pay cash to depositors on demand. It is the arrangement and the allocation of funds in such a way that can be drawn immediately without any loss of principle. More specifically, the idle money does not make any return. Therefore, the high liquidity may cause a flow profitability and inefficient performance of the overall Banking sector. It may cause failure of banking performance in long term (Pandey, 2000).

As other organization higher profitability is ultimate aim of commercial banks. One factor that affects profitability is qualitative management of liquidity. In the same way there are various factors that affect level of liquidity. Based on the review of above discussion and given definitions, liquidity is the ability of a financial institution to meet all legitimate demands for funds which is the specific topic of study. It plays a pivotal role in the successful operation in any business. In case of bank, it means stored in the balance sheet and in terms of liquidity available through purchased funds, ability of a bank to pay cash to depositors on demand, amount of money that can be drawn in urgent need. While managing level of liquidity organization have to bear risks namely funding and market liquidity risk. Organizations have to manage liquidity level tactfully for achieving the goal.

1.2 Statement of the problems

One of the major investment of commercial banks is liquidity. On every investment there should be considerable return to investors, so as to the commercial banks' liquidity investment. Investment in liquidity cheap or expensive depends upon the carefulness of liquidity management. Liquidity investment is always essential and equally risky as well. If they know about the exact factors that influencing the liquidity level, they will invest in liquidity confidently. It is unpredictable to specify what factors determine the liquidity level. There should be consider the external and internal factors before determining the level of investment in liquidity (pandey, 2000).

Banks and financial institutions should have to maintain balanced level of liquidity in efficient and effective manner and policymakers can affect their effort in constructive way. The management of bank and financial policy makers then needs to decide how they can do best to maintain balanced level of liquidity in their respective area. Study proposed that all managements of bank and policy makers should have to do close evaluation to the relationship between liquidity and its independent variable which may be inside the commercial banks or may be outside of the commercial banks. So they can find significance and direction of relation that will certainly helpful for proactive management of liquidity level and invest to the liquidity in beneficial way.

Vodova, (2011) explored the determinants of liquidity of commercial banks by using the Czech republic's commercial bank data controlled by independent variables of capital adequacy, share of non-performing loans, interest rates on interbank transaction, inflation rate, business cycle financial crisis and size of banks and explore significance positive relation between bank liquidity and capital adequacy, share of non-performing loans, interest rates on interbank loans transaction, negative influence of inflation rate, business cycle and financial crisis on liquidity. According to the findings, the relation between size of banks and their liquidity is ambiguous. In this context, this study will try to identify the determinants of liquidity and find out the degree of affection of those determinants and to know about liquidity behavior. More specifically, this present study is carried out to answer the following research question:

1. What are the determinants of liquidity in commercial banks of Nepal?
2. What is the relationship between bank specific variables and macro-economic variables on liquidity of commercial banks in Nepal?
3. What are the effects of bank's specific variables and macro-economical variables on liquidity of commercial banks in Nepal?

1.3 Purpose of the study

This study aims to analyze determinants of liquidity of commercial banks and their relationship with the liquidity based on information available in Nepalese context. The objectives of this study will examine the impact of the determinants of the liquidity of Nepalese commercial bank. The specific objectives of the study are listed as below:

1. To assess the determinants of liquidity in commercial banks of Nepal.
2. To examine the relationship between bank's specific variables and macro-economic variables on liquidity of commercial banks of Nepal.
3. To examine the effect of bank's specific variables and macro-economical variables on liquidity of commercial banks in Nepal.

1.4 Significance of the study

The study deals with determinants of level of liquidity in commercial banks of Nepal. The study also significance lies mainly in identifying and comparing the determinants factors of liquidity. Banks can use recommendation of this study for proactive management. It provides the real picture of ongoing condition which is beneficial to potential as well as existing shareholders, about identifying risk return and make decisions of utilizing funds. The study is also useful for depositors, merchant bankers as well as other stakeholders; they can identify the overall performance and ongoing liquidity risk of the banks. It will be helpful to those who want to conduct further study in this field. Mainly, this study will be significance for the researchers, research group and academicians for the future in the view of review.

1.5 Limitations of the study

The limitations of the study are:

1. The research only concentrates on determinants factors of level of liquidity in commercial banks in Nepal.
2. Data only collected through secondary sources, does not include the preference of different stakeholders.
3. The sample size and time period taken for the study is only covering nine banks and eleven years.
4. The model used in this study and analysis is limited on some quantitative methods.
5. This study only used IBM SPSS software analysis tools.
6. Result of this study may differ according to different state of nature and time.

1.6 Organization of the study

The whole study is divided into five chapters and the chapters are organized systematically as follows for the effective study.

Chapter I: This chapter consists of major issues to investigate along with the objective, significance, focus and limitation of the study.

Chapter II: This chapter is related to theoretical analysis a brief review of related literature. It tries to show overall scenario of determinants of liquidity level, its determinants and their effect in financial performance, especially analysis of commercial banks of Nepal.

Chapter III: This section describes the methodology employed in the study. This chapter deals with the nature and sources of data selection for study areas, method of analysis etc

Chapter IV: This chapter deals with the presentation and analysis of data and major findings by using proper tools and techniques.

Chapter V: The last chapter incorporated summary, conclusion and recommendation emanating from the study.

CHAPTER II

LITERATURE REVIEW

Review of literature has vital relevance with any research. Review of literature means reviewing research studies of other relevant propositions in the related area of the study so that all the past studies, their conclusions and deficiencies may be known and further research can be conducted. Different authors like Moore, (2010), Chagwiza, (2014), Rychtárik, (2009), Vodova, (2011) and Praet and Herzberg, (2008) provide various liquidity ratios such as liquid assets to total assets, liquid assets to deposits, liquidity assets to deposits plus borrowing, loans to total assets, loans to deposits, loans to deposits & short term borrowings and total loan to total liabilities. To sum up, we can employ various balance sheet items to identify liquidity trends and proactive management of liquidity level.

Among the above liquidity ratios, Vodova, (2011) has used two ratios, namely liquid assets to total assets (L_1) and liquidity assets to deposits plus borrowing (L_2), which is the current practice of the Nepalese banks mentioned by regulatory body's liquidity requirement related directives. Therefore these ratios are using in this study as the liquidity measures. In this chapter study have divided into two parts namely, conceptual review and empirical review which are mentioning below:

2.1 Theoretical review

2.1.1 Conceptual review

2.1.1.1 Capital adequacy ratio and bank liquidity

The capital adequacy ratios (CARs) are a measures of the amount of a bank's core capitals expressed as a percentage of its risk-weighted asset. Primary reason why banks hold capital is to minimizing risks, including the risk of liquidity crunches, protection against bank runs, and various other risks, most importantly credit risk. Though the reason why banks hold capital is motivated by their risk transformational role. Bank capital also do effect on banks' ability to create liquidity. These theories produce opposing predictions on the link between capital and liquidity creation. There are mainly two types of capital adequacy ratio to level of liquidity "financial fragility-

crowding out” “Risk Absorption”. First one predicts that higher capital reduces liquidity creation and vice versa predicts second one.

Focusing to the financial weakness, bank that raises funds from investors to provide financing to an entrepreneur. The entrepreneur may withhold effort, which reduces the amount of bank financing accessibility. More importantly, the bank may also withhold effort, which limits the bank’s ability to raise financing. A deposit contract mitigates the bank’s money holdup problem, because depositors might withdraw money from bank if the bank threatens to withhold effort and therefore maximizes liquidity creation. Providers of capital cannot run on the bank, which limits their willingness to provide funds, and hence reduces liquidity creation. Thus, the higher a bank’s capital ratio, the less liquidity it will create.. If deposit insurance were complete, depositors have no incentive to run on the bank, and a deposit contract does not mitigate the bank’s holdup problem. Moreover, there is negative effect of capital on liquidity creation (Diamond, and Rajan, 2001).

2.1.1.2 Non-performing loans and bank liquidity

Non-performing loans (NPLs) are loans that a bank customer fails to meet his/her contractual obligations in form of principal or interest payments exceeding 90 days. Liquidity risk is the outcome of credit risk, which is the inability of borrowers to meet their repayment obligation. NPLs are loans that give negative impact to banks in developing the economy.

A definite fact, financial systems are responsible for managing complex and advance financial transactions. The banking systems play the central role of mobilizing and allocating resources in the market, savings and surplus funds channeled to deficit units. Financial institutions oversee that operations are being run effectively and efficiently. The financial term for this activity is known as “Risk Transformation”. Granting loans generate most profits for banks. However, it involves high risk and eventually the main contributor to non-performing loans (NPLs). A core substance for sustained and rapid economic progress is financial stability. Financial stability measures are to much being used, among various indicators of financial stability include banks’ non-performing loan reflecting on its asset quality, credit risk and also its efficiency in the allocation of resources to productive sectors. NPLs are the main

contributor to liquidity risk, which exposes banks to insufficient funds for operations (Pandey, 2005).

2.1.1.3 Bank size and bank liquidity

According to the “too big to fail” argument, large banks would benefit from an implicit guarantee, thus decrease their cost of funding and allows them to invest in riskier assets. Therefore, “too big to fail” status of large banks could lead to moral hazard behavior and excessive risk exposure. If big banks are seeing themselves as “too big to fail”, their motivation to hold liquid assets is limited. In case of a liquidity shortage, they rely on a liquidity assistance of lender of last resort. Thus, large banks are likely to perform higher levels of liquidity creation that exposes them to losses associated with having more illiquid assets to satisfy the liquidity demands of customers. Hence, there would be positive relationship between bank size and illiquidity (Iannotta, 2007). Since small banks are likely to be focused on traditional intermediation activities and transformation activities they do have small amount of liquidity. Hence, there would be negative relationship between bank size and illiquidity (Rauch, 2008).

There are economies of scale in cash management. This would lead larger firms to hold less cash than smaller firms. It is argued that the fees incurred in obtaining funds through borrowing are uncorrelated with the size of the loan, indicating that such fees are a fixed amount. Thus, raising funds is relatively more expensive to smaller firms encouraging them to hold more cash than larger firms. Firms with more volatile cash flows face a higher probability of experiencing cash shortages due to unexpected cash flow deterioration. Thus, cash flow uncertainty should be positively related with cash holdings (Miller and Orr, 1966).

2.1.1.4 Deposit amount and bank liquidity

A bank's liquidity is determined by its ability to meet all of its anticipated expenses, such as funding new loans or fulfilling customer account withdrawals, using only liquid assets. The anticipated expenses can only be an estimate of how much customers may withdraw from savings or how many new mortgages may be issued advantageously. Hence banks particularly have to err on the safe side, maintaining

liquidity at all times without fail. The bigger the cushion of liquid assets relative to anticipated liabilities, the greater the bank's liquidity is and vice versa (Claire, 2021).

2.1.1.5 GDP and bank liquidity

According to the theory of bank liquidity and financial fragility, the relationship between banks liquidity preference and the business cycle is fundamental to explain the inherent instability of the capitalist system as a somehow increase by internal growth. In periods of economic expansion, which are characterized by high degree of confidence of the economic units about their profitability, there is a rise in the level of investment. During this expansion, economic units decrease their liquidity preference, preferring riskier capital assets with higher return. In this environment, economic units are more likely to hold less liquid capital assets and to incur short-term debt with higher interest rates. The loan able fund theory of interest states that the supply for loan, illiquid assets for banks, increases when the economy is at boom or going out of recession.

Banks' liquidity during periods of economic downturn, when lending opportunities may not be as good and they run down liquidity buffers during economic expansions when lending opportunities may have picked up. Thus, it can be expected that higher economic growth make banks run down their liquidity buffer and induce banks to lend more (Aspachs, 2005).

2.1.1.6 The rate of inflation and liquidity

Inflation is the rate at which the value of a currency is falling and consequently the general level of prices for goods and services is rising. In also common sense, inflation reduces the real value of money, and thus makes the liquidity constraint more binding. This problem can be resolved by having a financial intermediary which channels the funds from entrepreneurs with excess liquidity to those lacking liquidity. It means the more inflation rate the more level of liquidity is obvious. However, more researchers emphasize the importance of access of information unequally in credit markets stakeholder and demonstrate how increases in the rate of inflation adversely affect credit market clash with negative reflection for financial sector, both bank and equity market, performance and therefore long-run real activity. When we assumed information factor constant increase in inflation rate cause the financial sector fewer

loans, resource allocation is less efficient, and intermediary activities tend to diminish which cause adverse effects on capital/long term investment. In turn, the amount of liquid or short term assets held by economic agents including banks will rise with the rise in inflation (Huybens, 1998).

2.1.2. Empirical review

Bunda and Desquilbet (2008) investigated the determinants of liquidity risk of banks from emerging economies for a sample of commercial banks in 36 emerging countries between 1995 and 2000. Collected secondary data were analyzed with panel data regression analysis method. It was found that there is positive and statistically significant effect of capital adequacy, lending interest rate, inflation, GDP growth on liquidity of banks. On the other hand, the presence of prudential regulation and financial crises showed negative and significant impact on bank liquidity position. However, the effect of bank size is insignificant.

Vodova (2011) studied the determinants of liquidity of commercial banks by using the Czech republic's commercial bank data over the period from 2001 to 2009. Study used panel regression model taking liquidity as dependent variables and controlled by independent variables of capital adequacy, share of non-performing loans, interest rates on interbank transaction, inflation rate, business cycle financial crisis and size of banks and explore significance positive relation between bank liquidity and capital adequacy, share of non-performing loans, interest rates on interbank loans transaction, negative influence of inflation rate, business cycle and financial crisis on liquidity. Study found, the relation between size of banks and their liquidity is ambiguous.

Tseganes (2012) explored the impact of banks liquidity on financial performance using the data from 2000 to 2011 using non-performing loans, bank size capital adequacy ratio and loan growth rate as independent variables. Ordinary Least Squares (OLS), Augmented Dicker-Fuller (ADF) unit root test and Pearson's correlation analysis was adopted for the study. The study identified that non-performing loans are highly negatively correlated with banks liquidity but bank size, capital adequacy ratio and loan growth have the positive impact on banks' liquidity.

Subedi and Neupane (2013) examined the impact of bank's specific and macro economical variables' effects in their liquidity level in Nepalese commercial banks.

Study has covered the period from 2002/03 to 2011/12. The data for the study was based on primary data collected by questionnaire method and quarterly publications of banks as a secondary source. Data were analyzed through different statistical tools such as descriptive statistics, correlation and multiple regressions with variance inflation factor. The result of regression analysis showed that bank size had positive and significant impact and inflation rate had positive and insignificant effect on bank's liquidity. Similarly, it showed that capital adequacy, bank size, share of non-performing loans in the total volume of loans and liquidity premium paid by borrowers had negative and statistically significant repress on banks liquidity. Growth rate of gross domestic product, short term interest rate and inflation rate had negative and statistically insignificant impact on banks liquidity. And, loan growth rate had positive and statistically insignificant impact on banks liquidity capital.

Gautam (2014) investigated the determinants of banks liquidity and their impact on financial performance with empirical study of commercial banks in Nepal of the period of 2005 to 2014. Various specific and macroeconomic variables are taken into consideration as the independent variables. Multiple regression models have been used for the study. The result shows bank size, capital adequacy and inflation rate had a positive impact on bank liquidity in contrary non-performing loans, profitability and GDP growth rate had negative impact on bank liquidity. In significance concept capital adequacy ratio, non-performing loan and profitability were significant but bank size, GDP growth rate and inflation rate have insignificant with liquidity.

Moussa (2015) explored the factors which influence bank liquidity in Tunisian context. Study covered the period of 2000 to 2010, sampled 18 commercial banks and collected data through annual reports of bank. The methodology have been used for the study were static panel and panel dynamic. Two measures of liquidity; liquid assets /total assets and total loan/total deposits were estimated. It was found that financial performance, capital/total assets, operating cost/total assets, growth rate of GDP, inflation rate, delayed liquidity have significant impacts on bank liquidity while size, total loan/total assets, financial cost/total credit, total deposit /total assets does not have significant impact on bank liquidity.

Ojha (2016) investigated the impact of bank-specific and macroeconomic determinants of liquidity of Nepalese commercial banks. The study used 5

commercial bank data of the period 2010/11 to 2015/16. Data were assessed mainly by secondary sources, annual financial reports and economic survey reports. This study has taken GDP, return on assets, return on equity, non-performing loans, capital adequacy ratio and inter-bank rate as independent variables. Collected data were analyzed by mean, standard deviation, correlation and the regression analysis. The study reveals that there is significant influence on liquidity by GDP, return on assets, return on equity, non-performing loans and Inter-bank rate.

Sheefeni & Nyambe (2016) studied the effects of macroeconomic determinants on commercial banks' liquidity in Namibia. Study selected the period of 2005 to 2016. This study took GDP, inflation rate and monetary policy as independent variables. Collected data were analyzed using the unit root, bound test for co-integration and error correction model. The finding of the study reveals that real gross domestic product is the main determinant of commercial banks' liquidity in Namibia. It was also found that monetary policy rate is positively related to banks' liquidity though statistically insignificant. On the contrary, the results revealed a negative relationship between inflation and commercial banks' liquidity.

Bista (2018) examined the effects of bank's specific and macroeconomic variables on banks' liquidity in the case of Nepal. Study took the period of 2005 to 2016. This study has taken liquid asset /total asset and liquid asset/deposit and borrowing to measure the liquidity of Nepal by selecting the bank specific and macro-economic variables of Nepal. The multiple regressions model has adopted. The study concluded that, in relation to financial performance measured by liquid assets/total assets; CAR, real GDP and deposit have significant impact but inflation and bank size do have insignificant impact. Bank size, real GDP, deposit and inflation have positive coefficient, but CAR have negative coefficient. On the other hand, in determinants of liquidity measured by liquidity /deposit+ borrowing; CAR, real GDP and deposit have significant impact on the determining the liquidity but inflation and bank size had insignificant impact. Bank size, real GDP, deposit and inflation have positive correlation but CAR have negative correlation.

Khanal (2019) studied the effect of bank's specific and macroeconomic variables on banks' liquidity and their impact on financial performance in case of Nepal. The study took the sampling period of 2005/06 to 2015/16. This study has taken liquid asset

/total asset and liquid asset/deposit and borrowing to measure the liquidity of Nepal by selecting the bank specific and macro-economic variables of Nepal. Multiple regression model has used. The study concluded that ROA has positive significant impact whereas ROE, Size and inflation have negative and significant impact on liquidity. Similarly CAR and GDP has negative insignificant impact on loan to deposit ratio whereas, NPL has positive insignificant impact. This study concludes that ROA, ROE, bank size and inflation are major determinants of banks' liquidity

2.3 Summery of literature review

Author	Title	Methodology	Major Findings
Bista, (2018)	Determinants of Banks Liquidity and their Impact on Financial Performance: Empirical Study on Commercial Banks in Nepal	The Regression Analysis	deposit, capital adequacy, remittance and bank size are determinants of bank liquidity of the commercial bank out of which deposit is prevalent to increase bank liquidity and capital adequacy is key to decrease it
Chagwiza, (2014)	Zimbabwean Commercial Banks Liquidity and Its Determinants	The Regression Analysis	The study revealed that there is a positive link between bank liquidity and capital adequacy, total assets, gross domestic product and bank rate, found that the adoption of multi-currency, inflation rate and business cycle have a negative impact on liquidity. It seems the banks size and their liquidity is positively correlated.
Moussa, (2015)	The Determinants of Bank Liquidity: Case of Tunisia	The Regression Analysis	Study found that financial performance, capital adequacy ratio operating costs, growth rate of GDP, inflation rate, delayed liquidity have significant impact on bank liquidity while bank size, total loans, financial costs, total deposits does not have a significant impact on bank liquidity.
Ojha, (2016)	Macroeconomics And Bank-Specific Factors Affecting Liquidity: A Study Of Nepali Commercial Banks	The Regression Analysis	The results reveal that there is significant influence on liquidity by GDP, Return on assets, Return on equity, Non-performing loans, Capital adequacy ratio and Inter-bank rate

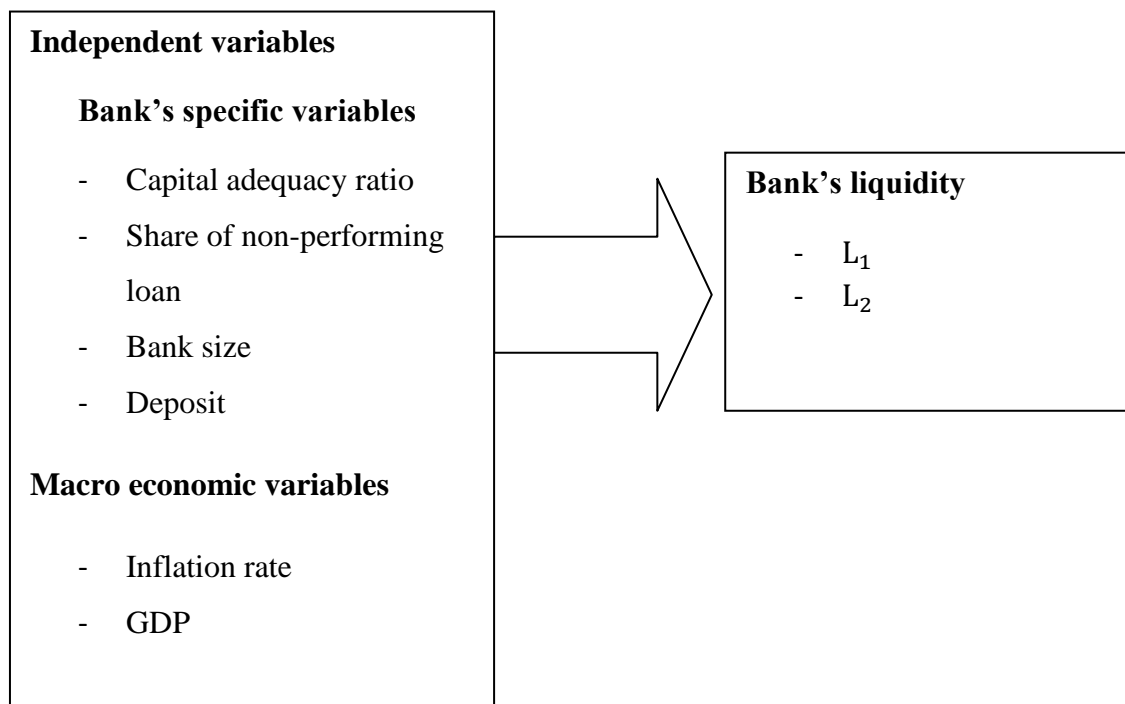
Khanal, (2019)	Determinants of Banks Liquidity and Their Impact on Financial Performance: Empirical Study on Commercial Banks in Nepal	The Regression Analysis	Results revealed that ROA has positive significant impact whereas ROE, size and inflation have negative significant impact on liquidity. Similarly CAR and GDP has negative insignificant impact on loan to deposit ratio whereas, NPL has positive insignificant impact. This study concludes that ROA, ROE, bank size and inflation are major determinants of Bank liquidity
Subedi&Neupane (2013)	Determinants of Banks Liquidity and Their Impact on Financial Performance in Nepalese Commercial Banks	The Regression Analysis	Study found capital adequacy and share of non-performing loans had a negative and statistically significant effect on the bank liquidity of the commercial banks whereas loan growth, GDP growth rate, liquidity premium and short term interest rates had a negative and statistically insignificant effect on the bank liquidity of the commercial bank. Similarly, bank size had a positive and a statistically significant effect and the inflation rate had a positive but insignificant effect on the bank liquidity of the commercial banks.
Vodova, (2011)	Liquidity of Czech Commercial Banks and Its' Determinants,	The Regression Analysis	Found positive link between bank liquidity and capital adequacy, share of non-performing loans and interest rates on loans and on interbank transaction, negative influence of inflation rate, business cycle and financial crisis on liquidity, the relation between size of banks and their liquidity is ambiguous.
Gautam, (2014)	Determinants of Banks Liquidity and Their Impact on	The Regression Analysis	It has found bank size, capital adequacy and inflation rate had a positive impact on bank liquidity but non-performing loans, profitability and GDP

	Financial Performance: Empirical Study on Commercial Banks in Nepal		growth rate had negative impact on bank liquidity of the commercial banks. Statistically, capital adequacy, non-performing loan and profitability were significant but bank size, GDP growth rate and inflation rate were insignificant. The study concluded capital adequacy, non-performing loan, bank size, profitability, GDP growth rate and inflation rate as determinants of bank liquidity of the commercial banks.
Sheefeni&Nyambe, (2016)	Macro-economic Determinants of Commercial Banks' Liquidity in Namibia	Unit root, bound test for co integration and error correction model were employed	Results revealed that real gross domestic product is the main determinant of commercial banks' liquidity in Namibia. It was also found that monetary policy rate is positively related to banks' liquidity though statistically insignificant. On the contrary, the results revealed a negative relationship between inflation and commercial banks' liquidity.
Tseganesh (2012)	Determinants of Commercial Banks' Liquidity in Ethiopia	Document survey approach	Result stated that capital adequacy, bank size, share of nonperforming loans in the total volume of loans, interest rate margin, inflation rate and short term interest rate had positive and statistically significant impact on banks liquidity. Real GDP growth rate and loan growth had statistically insignificant impact on banks liquidity.

From above literature review it can be concluded that in some study area researcher's conclusions are contradictory based on researcher's study time and context especially on bank size and profitability effect on liquidity level of banks. Collectively, all researchers found positive relation between bank liquidity and capital adequacy, share of non-performing loans and interest rates on loans and on interbank transaction and negative relation with inflation rate, business cycle and financial crisis on liquidity level.

2.4 Theoretical framework

The conceptual framework is developed from the review of literature discussed above. It shows the relationship between the independent variables such as bank specific and macroeconomic and dependent variables such as bank liquid assets to total assets ratio (L_1) and liquid assets to deposit plus borrowing (L_2). Macroeconomic variables consist of GDP and inflation whereas; a bank specific variable consists of capital adequacy ratio, shares of non-performing loan, amount of deposit and bank size. The following figure shows the dependent and independent variables.



Ojha, P. (2016) Macroeconomics And Bank-Specific Factors Affecting Liquidity: A Study Of Nepali Commercial Banks

2.4.1 Definitions of variables

S.N	Name of variables	Symbols	Measurement
1	Liquidity/total assets	L_1	Percentage
2	Liquidity/ deposit+ borrowing	L_2	Percentage
3	Bank size	TA	RS. $\text{Log}_5\text{Totalassets}$
4	Capital adequacy ratio	CAR	Ratio
5	Share of non-performing loan	SONPL	Ratio
6	Deposit	DEP	RS. $\text{Log}_5\text{Deposit}$
7	Gross domestic product	GDP	RS. $\text{Log}_{10}\text{GDP}$
8	Inflation	INF	Percentage

Independent variables:

Capital adequacy ratio

Capital adequacy shows the strength of bank capital against the vagaries of economic and financial environment. Generally, the capital is positively related to the financial performance of banks. The capital of bank is a common equity plus qualifying cumulative perpetual preferred stock plus minority interest in equity account of consolidated subsidiaries. Thus, it is a primary means of protection against the risk of insolvency and failure. The financial fragility crowding out deposit hypothesis predict negative relation whereas, risk absorption hypothesis suggests positive relationship between capital adequacy and liquidity.

Share of non-performing loan

A non-performing loan is a loan that is default or close to be default. Many loans become non-performing loan after being default for 90 days, but that can be depends upon the contract term. The main causes of that is high interest rate, lower GDP, poor appraisal system, inflation, unemployment and improper lending disbursement to agriculture sector. It has negative impact of performance of any financial institutions.

Bank size

Bank size measures its general capacity to undertake its intermediary functions. Large banks are likely to perform higher levels of liquidity creation that exposes them to

losses associated with having to sale illiquid assets to satisfy the liquidity demands of customers. However, since small banks are likely to be focused on traditional intermediation activities and transformation activities and vice versa to larger firms. Hence small firms do have small amount of liquidity and larger company has higher size of liquidity.

Deposit

A deposit is a sum of money which is in a bank account or savings account, especially a sum which will be left there for some time. Bank deposits consist of money placed into banking institutions for safekeeping. These deposits are made to deposit accounts such as savings accounts, checking accounts and money market accounts. One of the most prominent roles performed by banks is the creation of liquid claims on illiquid assets. This is often done by offering demand-deposit contracts. Such contracts give depositors options to withdraw their deposits when they need liquidity. Increase in deposit by customers' leads to increasing amount of money available to the bank hence, basically there is proportionate relation between deposit and liquidity.

GDP

It is the largest quantitative measure of total economic activity. It is the sum total value of goods and services that is produced within the boundary of country in the specified periods of time. It is the monetary value of goods and service that is produced within the national economy. It is one of the strong determinants of liquidity because there are so many factors linked with GDP. Among of two types of GDP this study has taken real GDP.

Inflation

Inflation is the sustainable increase in general price level that are the value of money decrease. An increase in the rate of inflation drives down the real rate of return not just on money, but on assets in general. The implied reduction in real returns exacerbates credit market frictions. Since these market frictions lead to the rationing of credit, credit rationing becomes more severe as inflation rises. As a result, the financial sector makes fewer loans, resource allocation is less efficient, and

intermediary activity diminishes with adverse implications for capital/long term investment.

Dependent variables:

Bank liquidity

The bank liquidity as a dependent variable consists of Liquid assets to total assets (L_1) and Liquidity assets to total deposits plus short term borrowing.

Liquid assets to total assets ratio (L_1)

Liquid assets to total assets ratio gives information about the general liquidity shock absorption capacity of a bank. As the general rule, the higher the share of liquid assets in total assets, the higher the capacity to absorb liquidity shock, given that market liquidity is the same for all banks in the sample. Nevertheless, high value of this ratio may be also interpreted as inefficiency. Since liquid assets yield lower income liquidity bears high opportunity costs for the bank. Therefore, it is necessary to optimize the relation between liquidity and profitability. According to the NRB guidelines liquid assets of banks include cash on hand, deposit in other banks, and short term government securities, money at call. This measure of liquidity was taken as benchmark measure. $L_1 = \text{Liquid Assets} / \text{Total Assets}$

Liquid assets to deposit plus borrowing ratio (L_2)

This liquidity ratio identifies liquidity trend of bank. This ratio focuses on bank sensitivity towards sudden withdrawal of deposits. If the ratio is greater than 1, the bank is able to meet its obligation in terms of withdrawal of deposits Gitman, (2000). It is more focused on the bank's sensitivity to selected types of funding it has been included deposits of households, enterprises and other financial institutions. The ratio L_2 should therefore capture the bank's vulnerability related to these funding sources. $L_2 = \text{Liquid Assets} / (\text{Deposit} + \text{Borrowing})$.

2.5 Research gap

Research gap is the difference between previous work done and the present research work. There has been lot of research works and studies undertaken to examine the variables that affect to liquidity level with sampling various bank and financial institutions. However, the purpose of study is quite different from the previous studies in terms of the time it covers from 2009/10 to 2019/20. Samples are taken based on stratified sampling methods considering firstly types of commercial bank and secondly the bank size. It was found most of the researchers used convenience sampling method. In this study micro environment variables, capital adequacy ratio, share of non-performing loan, deposits amount and bank size, macro environment variables, GDP and inflation rate, has taken. In this ground this study is different from previous studies titled determinants of liquidity level in Nepalese commercial banks.

CHAPTER III

RESEARCH METHODOLOGY

This chapter puts lights on the research process and methods design to meet the stated objectives of the study. The research methodology explores the research process regarding the exploration the impact of particular macro and micro variables in liquidity level of bank. The broad process of research methodology has been further categorized for simplicity into various subtopics which are as follows:

3.1 Research design

Research methodology refers to the numerous process adopted by the researchers during the research period. It is the techniques used during the research problem solving in systematic manner. This includes many techniques and is crucial for every research work.

The research design is specification of methods and procedures for acquiring the needed information to solve the problem. Research methodology is the process of assigning at solution of the problem through systematic way for dealing with data inputs, data presentation and analysis, and research output. In this study descriptive research design will use.

The study is based on two types of research design namely descriptive and analytical. To describe the nature and behavior of variables, descriptive design is used. To examine and analyze the relationships casual comparative research design has been used. The method of this study is quantitative approach. A descriptive tools, descriptive statistics, model summary and ANOVA are used. As a analytical tools, correlation and regression are applied to analyze data collected from the annual reports of the sample taken banks for identifying direction and significance level of selected independent variables on determining liquidity level.

3.2 Population and sample

The total number of commercial bank represent as the total population for the purpose of this study. Hence, the population consists of twenty-seven commercial banks. Out of the total population nine banks are used as samples. Banks have been taken as a

sample based on stratified random sampling technique since it have limited population and heterogeneous type, taking into consideration type and size of bank. To do this research work eleven year's annual reports have been taken of respective banks which are published by the bank after audit to the general public and economic survey reports. It covers the fiscal year of 2009/10 to 2019/20. Sample banks are as follows:

1. Government bank
 - Rastriya Banijya bank
2. Joint venture bank
 - NABIL bank
 - Everest bank
3. Private commercial bank
 - Nepal Investment bank
 - NIC ASIA bank
 - NMB bank
 - SANIMA bank
 - Prime bank
 - Siddhartha bank

3.3 Sources of data and data collection procedure

Without any data, nothing can be studied. So for any statistical investigation, the collection of data of data is more important. The study is based on secondary data in nature. Availability of data about various aspects of financial information and macroeconomic variables are as follows:

Capital Adequacy Ratio	-Annual reports
The share of non-performing loans	-Annual reports
Bank size	-Annual reports
Amount of deposit	-Annual report
Gross domestic product	-Economic survey report
Inflation rate	-Economic survey report

In addition to these, different published articles, report, book, journal, and graduate research project are also used.

3.4 Data analysis procedure

Analysis is an important part of the study under which data are presented and analyzed in useful format. Here the collected data are classified, edited, and presented in the appropriate tables for analysis and interpretation and made up-to-date. The obtained secondary data are calculated using SPSS for desire results. In SPSS software, used descriptive and analytical tools for achieving the objectives of the study. Basically simple analytical statistical tools such as tabling, covariance and regression are adopted in this study. Especially descriptive analysis method is used for the study.

3.5 Data analyzing tools

This thesis work is based on financial as well as statistical analysis. Various tools and techniques are applied for making the thesis work more presentable. Some important statistical tools have been used to present and analysis the data for achieving the objectives are as follows:

3.5.1 Financial ratios

Ratios are the most commonly used financial tools which will be used in this study as well. These ratios help in simplifying the annual reports data into more understanding view point which aid in predicting the future and knowing the present. The ratios are used in this study are as bellow:

1. Liquid assets to total assets ratio (L_1) Liquid assets to total assets ratio should give us information about the general liquidity shock absorption capacity of a bank. As a general rule, the higher the share of liquid assets in total assets, the higher the capacity to absorb liquidity shock, given that market liquidity is the same for all banks in the sample

$$L_1 = \text{Liquid assets} / \text{total assets}$$

2. Liquid assets to deposit plus borrowing ratio (L_2) The liquidity ratio identifies liquidity trend of bank. This ratio focuses on bank sensitivity towards sudden withdrawal of deposits. If the ratio is greater than 1, the bank is able to meet its obligation in terms of withdrawal of deposits. Lower value indicates a bank's increased sensitivity related to deposit withdrawals.

$$L_2 = \text{Liquid assets} / (\text{deposit} + \text{borrowing})$$

3. Capital adequacy is one of the elements that indicate the measurement of financial strength of a bank. It is the capital position of the bank which somewhat assure depositors that they will be compensated if any failure occurs. The capital adequacy ratio here is extracted from annual report which is calculated as the ratio of regulatory capital (tier I + tier II) to total risk weighted assets.
4. Share of nonperforming loan is also the one independent variables using in this study. It is the portion of loan and advance bank assumed to be default on the total loan and advances. Share of non-performing loan is extracted from annual report of particular commercial bank.

3.5.2 Statistical tools

1. Descriptive analysis:

To define characteristics between dependent and independent variables descriptive statistics of the variables (both dependent and independent) were calculated over the sample period. A descriptive statistics method helps the researcher in picturing the existing situation and allows relevant information. It is used to describe the characteristic of the variables. Descriptive statistics transform raw data into the form that make it easy to understand and interpret.

The mean represents the average value of the variable while median reveals the centre value of the data. Standard deviation is a measure of the dispersion of a set of data from its mean. Maximum and minimum shows lowest and highest values of the data. Small standard deviation shows data point is inclined to be extremely close to mean while high value of standard deviation shows data set is border out over a large range of value

2. Correlation coefficient analysis

Correlation coefficient is a relative measure of co-movements between variables. It is the measurement of linear relationship between two or more variables. Its values lie between -1 to +1.

3. Regression analysis

The models employed in this study intend to analyze the relationship between internal as well as macroeconomic determinants of liquidity. The following regression model is used in this study in an attempt to examine the empirical relationship between the bank's specific and macroeconomic variables on liquidity of Nepalese commercial bank. Therefore, the following model equation is designed to test the hypothesis. From the conceptual framework the function of dependent variables (i.e. Determinants) takes the following form:

Determinants of liquidity = f (CAR, SONPL, TA, DEP, GDP, INF)

More specifically, the given model has been segmented into following models:

Model I

Model I tries to find out the determinants of liquidity $L_{1it} = \beta_0 + \beta_1(CAR)_{it} + \beta_2 \log_5(TA)_{it} + \beta_3 \log_5(DEP)_{it} + \beta_4 \log_{10}(GDP)_{it} + \beta_5(INF)_{it} + \beta_6(SONPL)_{it} + \epsilon_{it}$

Model II

Model II tries to find out the determinants of liquidity $L_{2it} = \beta_0 + \beta_1(CAR)_{it} + \beta_2 \log_5(TA)_{it} + \beta_3 \log_5(DEP)_{it} + \beta_4 \log_{10}(GDP)_{it} + \beta_5(INF)_{it} + \beta_6(SONPL)_{it} + \epsilon_{it}$

Where,

β_0	=	Constant term
CAR	=	Capital Adequacy Ratio
TA	=	Bank size defined by the log of total assets
DEP	=	Deposit of bank on the year.

GDP	=	Gross Domestic Product
INF	=	Inflation
SONPL	=	Share of non-performing loan
L_1	=	Liquidity/total assets.
L_2	=	Liquidity/Deposit+ Borrowing
$\beta_1\beta_2\beta_3\beta_4\beta_5\beta_6$	=	Regression coefficients
ϵ	=	Error item
i	=	commercial bank
t	=	index of time period

4. ANOVA

Analysis of variance, or ANOVA, is strong statistical technique that is used to show difference between two or more means or components through significance tests. It is a collection of statistical models used to analyze the differences among group means and their association. It also shows us a way to make multiple comparisons of several population means.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter is based on analysis and interpretation of data collected during the study of bank specific and macroeconomic determinants of liquidity of commercial banks in Nepal. The data for this study was obtained from published financial statements of the selected commercial banks as sample, economic survey report conducted by national bureau of statistics and Nepal Rastra Bank's supervision report. Data has been analyzed with reference to the objectives of study as mentioned in the chapter earlier. These secondary data were calculated by using SPSS software. In this section, the first section deals with determinants of liquidity. Then, the descriptive statistics and the correlation analysis are discussed. Finally, the results of the regression analysis are discussed by supporting empirical evidence. Hence, the systematic and orderly interpretations and analysis of findings is discussed in this chapter. Following table shows description and analysis of variables. It contained the dependent and independent variables, mentioned to explain their relationship.

4.1 Descriptive analysis of variables

The detailing and descriptive analysis of nine commercial banks, 2009/10 to 2019/20 of independent variables are as follows:

4.1.1 Analysis of bank's specific variables

Table 4.1 Detail of capital adequacy ratio (CAR)

Fiscal year	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDHARTHA	NIBL	NABIL	Everest
2009/10	12.66	17.61	9.78	-29.46	15.56	10.01	8.5	8.77	8.39
2010/11	11.34	15.31	13.66	-22.28	27.54	9.05	8.77	8.83	8.46
2011/12	9.91	13.95	12.65	-9.77	19.82	8.18	9.34	9.3	9.61
2012/13	12.21	10.42	11.88	1.51	13.91	8.28	10.01	9.98	9.31
2013/14	11.84	9.91	11.53	4.46	11.52	8.39	9.52	9.68	9.35
2014/15	10.53	8.84	11.29	10.16	10.13	7.58	9.54	10.18	10.44
2015/16	10.69	9.34	10.76	9.31	10.69	8.78	13.05	10.51	10.34
2016/17	12.38	12.39	12.45	9.15	14.07	11.02	11.58	11.21	12.58
2017/18	8.66	14.78	11.43	9.98	11.14	10.99	11.58	11.81	12.65
2018/19	8.24	11.81	12.45	13.39	10.63	10.11	N/A	11.58	12.38
2019/20	8.12	12.8	10.78	12.68	10.37	9.26	N/A	10.69	11.92

Note: Financial reports

Table 4.1 shows the distribution of capital adequacy ratio (CAR) of selected commercial bank of sampled 11 fiscal years. Maximum CAR of NIC ASIA bank is 12.69% citing in fiscal year 2015/16 and minimum CAR is 8.12 in fiscal year 2019/20. 17.61% is maximum CAR of NMB and 8.84% is minimum CAR. RBB got more fluctuation on CAR minimums of -29.46% to maximum of 13.39%. In fiscal year 2010/11 SANIMA got 27.54% which is maximum CAR value of SANIMA bank and 10.37% in fiscal year 2019/20 is minimum value. SIDDHARTH bank seems more consistent in terms of CAR with having maximum value of 11.2% and minimum value of 7.58% in fiscal year 2016/17 and 2014/15 respectively. Maximum CAR of NIBL bank is 13.05% citing in fiscal year 2015/16 and minimum CAR is 8.5% in fiscal year 2009/10. In fiscal year 2017/18 NABIL got 11.81% which is maximum CAR value of NABIL bank and 8.77% in fiscal year 2009/10 is minimum value. And finally in fiscal year 2017/18 CAR is 12.68, is maximum and CAR of 8.39% in fiscal year 2009/10 is minimum value of Everest bank.

Table 4.2 Analysis of capital adequacy ratio

Banks	Minimum	Maximum	Mean	Std. Deviation
EVEREST	8.39	12.65	10.4936	1.63318
NABIL	8.77	11.81	10.2309	1.04371
NIBL	8.5	13.05	10.21	1.52229
NIC ASIA	8.12	12.66	10.5982	1.67517
NMB	8.84	17.61	12.4691	2.76211
PRIME	9.78	13.66	11.6964	1.07646
RBB	-29.46	13.39	0.83	14.7907
SANIMA	10.13	27.54	14.12	5.331
SIDDHARTH	7.58	11.02	9.2409	1.15551

Note: SPSS result

Table 4.2 shows descriptive statistics- mean, maximum and minimum values and standard deviation of each year's capital adequacy ratio associated with selected commercial banks for eleven-year period. The mean of capital adequacy ratio of EBL, NABIL, NIBL, NICASIA, NMB, PRIME, RBB, SANIMA and SIDDARTHA are percentage of 10.49, 10.23, 10.21, 10.59, 12.46, 11.69, 0.83, 14.12 and 9.24 with respective standard deviation of 1.633, 1.431, 1.52, 1.675, 2.76, 1.07, 14.79, 5.331 and

1.155 These values show that the highest average capital adequacy ratio contains in NMB and lowest in RBB with percentage of 12.46 and 0.83 respectively. The collected data relating to capital adequacy ratio of RBB bank is more deviate from its mean value having higher standard deviation, concluding comparative higher risk for investing and NABIL have lower with 1.0437 have lower risk for investment.

Table 4.3 Detail of share of non-performing loan (SoNPL)

Fiscal year	EVEREST	NABIL	NIBL	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDHARTHA
2009/10	0.16	1.48	0.67	0.72	0.7	0	9.81	0.08	0.53
2010/11	0.34	1.77	0.94	0.6	0.27	0.57	10.91	0.004	0.79
2011/12	0.84	2.33	3.32	0.73	2.45	0.76	7.27	0.479	1.52
2012/13	0.62	2.13	1.91	2.32	1.8	2.23	5.32	0.03	2.39
2013/14	0.2	2.23	1.77	2.33	0.55	2.43	4.75	0.017	2.75
2014/15	0.25	1.82	1.25	2.07	0.42	1.83	3.77	0.07	1.8
2015/16	0.38	1.14	0.88	0.76	1.81	1.23	4.25	0.019	1.47
2016/17	0.66	0.8	0.83	0.36	1.68	0.88	5.35	0.01	1.09
2017/18	0.97	0.55	1.36	0.06	0.88	0.85	6.38	0.03	1.3
2018/19	0.16	0.74		0.46	0.06	0.88	4.79	0.08	0.75
2019/20	0.22	0.97	N/A	0.75	1.63	1.23	4.08	0.45	1.38

Note: Financial reports

Table 4.3 consists of the share of non-performing loan (SoNPL) of selected commercial bank of sampled 11 fiscal years. Maximum SoNPL of Everest bank is 0.97 citing in fiscal year 2017/18 and minimum SoNPL is 0.16 in fiscal year 2018/19. 2.33 is maximum SoNPL of NABIL and 0.55 is minimum SoNPL. NIBL got SoNPL minimums of 0.67 to maximum of 3.32. In fiscal year 2013/14 NIC ASIA bank got 2.33 which is maximum SoNPL value of NIC ASIA bank and 0.06 in fiscal year 2017/18 is minimum value. Maximum SoNPL of NMB bank is 2.41 citing in fiscal year 2011/12 and minimum SoNPL is 0.06 correspondent to in fiscal year 2008/19. In fiscal year 2017/18 I found only Prime bank with minimum value of SoNPL value of 0.00 in fiscal year of 2009/10 and 2.43 is maximum SoNPL value of Prime bank in fiscal year 2013/14. RBB got comparatively high values in terms of SoNPL value with having maximum value of 10.91 and minimum value of 3.77 in fiscal year 2011/12 and 2014/15 respectively SANIMA bank got comparatively less in terms of SoNPL value with having maximum value of 0.479 and minimum value of 0.01 in fiscal year 2011/12 and 2016/17 respectively. And finally in fiscal year 2013/14

SoNPL is 2.75, is maximum and SoNPL of 0.53 in fiscal year 2009/10 is minimum value.

Table 4.4 Analysis of share of non-performing loan

Banks	Minimum	Maximum	Mean	Std. Deviation
EVEREST	0.16	0.97	0.4364	0.2888
NABIL	0.55	2.33	1.45091	0.64409
NIBL	0.67	3.32	1.4367	0.82426
NIC ASIA	0.06	2.33	1.01455	0.81671
NMB	0.06	2.45	1.11364	0.78585
PRIME	0	2.43	1.17182	0.72949
RBB	3.77	10.91	6.0618	2.36586
SANIMA	0.004	0.479	0.11536	0.17487
SIDDHARTHA	0.53	2.75	1.43364	0.68025

Note: SPSS result

The table 4.4 shows descriptive statistics; mean, maximum and minimum values and standard deviation of each year's share of non-performing loan associated with selected commercial banks for eleven-year period. The mean of share of nonperforming loan of EBL, NABIL, NIBL, NICASIA, NMB, PRIME, RBB, SANIMA and SIDDARTHA are percentage of 0.436, 1.45, 1.43, 1.014, 1.113, 1.1718, 6.06, 0.1153 and 1.4336 with respective standard deviation of 0.288, 0.644, 0.824, 0.816, 0.785, 0.7294, 2.36, 0.1747 and 0.680. These values show that the highest average share of non-performing loan contains in RBB and lowest in SANIMA with percentage of 6.061 and 0.1153 respectively. The mean value of share of non-performing loan of RBB bank is more deviate from its' mean value having higher standard deviation.

Table 4.5 Detail about total asset (Rs.000)

Fiscal year	EVEREST	NABIL	NIBL	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDHARTHA
2009/10	41382760	52151684	57305413	15543572	13226578	20218830	67910654	7238558	22802429
2010/11	46236212	58141437	58356827	17699569	15948192	22086102	74880374	9363380	24405872
2011/12	55813129	63193414	65756231	17871019	18494830	27157976	93905093	13722466	29579198
2012/13	65741150	73241260	73152154	45822344	25125984	32409183	101523505	21976539	33653855
2013/14	70445082	90292964	86173927	51500485	30211663	38030964	122557920	29376986	40277752
2014/15	99167293	118695997	104345436	60519399	41337463	45800892	139560806	40301197	50647295
2015/16	114018921	131347288	134516966	83573552	78864969	54408913	172058371	56128555	76124947
2016/17	116945280	144017861	155361353	103108261	93074422	77786847	179074721	69481703	91586102
2017/18	144811151	160978071	171893546	170943177	112391430	95043979	197332000	91821952	119869218
2018/19	170077533	N/A	N/A	217702263	135470410	102255829	226410177	109064487	151401764
2019/20	185023189	N/A	N/A	251852885	179423373	152182993	266390912	126310981	182468449

Note: Financial reports

Table 4.5 consists of the total assets (bank size) of selected commercial bank of sampled 11 fiscal years. Maximum total asset of Everest bank is RS.185023189 citing in fiscal year 2019/20 and minimum total assets is Rs. 41382760 in fiscal year 2009/10. RS.160978071 is maximum total assets of NABIL and Rs. 52151684 is minimum total assets. Similarly maximum total asset of NIBL is Rs. 171893546 citing in fiscal year 2017/18 and minimum total assets is Rs. 57305413 in fiscal year 2009/10. In fiscal year 2019/20 NIC ASIA bank got Rs. 251852885 which is maximum total assets value of NIC ASIA bank and Rs. 15543572 in fiscal year 2009/10 is minimum value. The maximum total asset of NMB bank is Rs. 179423373 citing in fiscal year 2019/20 and minimum total assets is Rs. 13226578 correspondent to in fiscal year 2009/10. In fiscal year 2009/10 I found Prime bank with minimum value of total assets value of RS. 20218830 and Rs. 152182993 is maximum total assets value of Prime bank in fiscal year 2019/20. RBB got comparatively high values in terms of total assets value with having maximum value of Rs. 266390912 and minimum value of Rs. 67910654 in fiscal year 2019/20 and 2009/10 respectively. SANIMA bank got comparatively less in terms of total assets value with having maximum value of Rs. 126310981 and minimum value of Rs. 7238558 in fiscal year 2019/20 and 2009/10 respectively. And finally in fiscal year 2019/20 total assets is Rs.182468449 is maximum and total assets of Rs.22802429 and in fiscal year 2009/10 is minimum value.

Table 4.6 Analysis of bank size

Banks	Minimum	Maximum	Mean	Std. Deviation
EVEREST	17.54	19.04	18.3106	0.5214
NABIL	17.77	18.9	18.3339	0.42303
NIBL	17.86	18.96	18.3479	0.4221
NICASIA	16.56	19.34	17.9505	1.00387
NMB	16.4	19.01	17.665	0.93057
PRIME	16.82	18.84	17.7157	0.67043
RBB	18.03	19.4	18.7311	0.45319
SANIMA	15.79	18.65	17.3902	0.99621
SIDDHARTHA	16.94	19.02	17.8799	0.74603

Note: SPSS Result

Table 4.6 demonstrates descriptive statistics; mean, maximum and minimum values and standard deviation of each year's size of bank (\log_{10} total assets) associated with selected commercial banks for eleven-year sample period. The mean of size of bank of EBL, NABIL, NIBL, NICASIA, NMB, PRIME, RBB, SANIMA and SIDDARTHA are Rs. of 18.31, 18.33, 18.34, 17.95, 17.66, 17.71, 18.73, 17.39 and 17.87 with respective standard deviation of 0.521, 0.423, 0.4221, 1.003, 0.93, 0.67, 0.453, 0.9962 and 0.746. These values show that the highest average bank size contains in RBB and lowest in SANIMA with Rs. of 18.73 and 17.39 respectively. The total asset of NICASIA bank is more deviate from its mean value having higher standard deviation and NIBL has lower with 0.4221. Collectively having lower standard deviation collected data assume to be more realistic.

Table 4.7 Detail of amount of deposit (RS000)

Fiscal year	EVEREST	NABIL	NIBL	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDH
2009/10	36932310	46410701	50094725	12480760	10110689	17883518	68625869	5760495	20197029
2010/11	41127914	49696113	50138122	13677364	12866221	18938902	73941297	6356737	21575653
2011/12	50006100	55023695	57010603	15351206	15982555	23990952	87782195	11178734	25948505
2012/13	57720464	63609808	62428845	39908774	22185626	28798028	91093908	17789329	28392822
2013/14	62108135	75360769	73831375	44984218	27087258	34045262	107269942	24873849	35414007
2014/15	83093789	103957095	90631486	53477184	36722917	41005754	124221662	34045316	44740731
2015/16	91638884	109288114	99353328	139578561	63452888	43745461	139259011	41664487	57772206
2016/17	94091892	117436362	118921049	79906602	72317666	59680088	146587041	56161055	71415816
2017/18	115611705	134810669	136585576	64606790	83970867	72635987	164210303	77849380	94579591
2018/19	129568152	N/A	N/A	177374678	96641516	77040074	189255335	89373729	114923367
2019/20	143545475	N/A	N/A	201630384	131660368	119441613	230827711	107250202	139609497

Note: Financial reports

Table 4.7 consists of the amount of deposit of selected commercial bank of sampled 11 fiscal years. Maximum amount of deposit of Everest bank is RS. 143545475 citing in fiscal year 2019/20 and minimum amount of deposit is Rs. 36932310 in fiscal year 2009/10. RS.134810669 is maximum amount deposit of NABIL and Rs. 46410701 is minimum deposit amount. NIBL got minimum of Rs.50094725 to maximum of Rs.136585576. In fiscal year 2019/20 NIC ASIA bank got Rs. 201630384 which is maximum deposit amount value of NIC ASIA bank and Rs. 12480760 in fiscal year 2009/10 is minimum value. Maximum deposit amount of NMB bank is Rs. 131660368 citing in fiscal year 2019/20 and minimum deposit amount is Rs. 10110689 correspondent to in fiscal year 2009/10. In fiscal year 2009/10 I found Prime bank with minimum value of deposit amount value of RS. 17883518 and Rs. 119441613 is maximum deposit amount value of Prime bank in fiscal year 2019/20. RBB got comparatively high values in terms of deposit amount value with having maximum value of Rs. 230827711 and minimum value of Rs. 68625869 in fiscal year 2019/20 and 2009/10 respectively SANIMA bank got comparatively less in terms of deposit amount value with having maximum value of Rs. 107250202 and minimum value of Rs. 5760495 in fiscal year 2019/20 and 2009/10 respectively. And finally in fiscal year 2019/20 deposit amount is Rs. 139609497, is maximum and deposit amount of Rs. 20197029 in fiscal year 2009/10 is minimum value in Siddhartha bank.

Table 4.8 Analysis of amount of deposit

Banks	Minimum	Maximum	Mean	Std. Deviation
EVEREST	17.42	18.78	18.1324	0.4627
NABIL	17.65	18.72	18.1748	0.40316
NIBL	17.73	18.73	18.1609	0.37315
NICASIA	16.34	19.12	17.7533	0.99735
NMB	16.13	18.7	17.4478	0.88329
PRIME	16.7	18.6	17.5323	0.61194
RBB	18.04	19.26	18.6088	0.39115
SANIMA	15.57	18.49	17.1714	1.03112
SIDDHARTHA	16.82	18.75	17.6887	0.68517

Note: SPSS results

Table 4.8 demonstrates descriptive statistics- mean, maximum and minimum values and standard deviation of each year's amount of deposit (log10total deposit) associated with selected commercial banks for eleven-year sampled period. The mean of amount of deposit of EBL, NABIL, NIBL, NICASIA, NMB, PRIME, RBB, SANIMA and SIDDARTHA are Rs. of 18.13, 18.17, 18.16, 17.75, 17.44, 17.53, 18.60, 17.17 and 17.68 with respective standard deviation of 0.462, 0.403, 0.373, 0.997, 0.883, 0.611, 0.39, 1.031, and 0.685. These values show that the highest average amount of deposit contains in RBB and lowest in SANIMA with Rs.18.60 and 17.17 respectively. The amount of deposit of SANIMA bank is more deviate from it's mean value having higher standard deviation and NIBL have lower with 0.373. Collectively all sampled banks, having lower standard deviation collected data assume to be more realistic going to lead.

Table 4.9 Detail of macro-economic variables

Fiscal year	GDP(Millions)	INF(%)
2009/10	1,192.80	9.6
2010/11	1,367	8.3
2011/12	1527.3	9.9
2012/13	1,695	9.1
2013/14	1964.5	9.1
2014/15	2130.1	7.2
2015/16	2,253.16	9.9
2016/17	2674.49	4.5
2017/18	3044.93	4.2
2018/19	3458.79	4.6
2019/20	3767.04	6.5

Note: Economics survey report by central bureau of statistic Nepal

Table 4.9 consists of detail about external economic environment viz, real GDP and Inflation rate of sampled 11 fiscal years. Here maximum GDP value of Rs. 3767.04 citing in fiscal year 2019/20 and minimum GDP value is Rs. 1,192.80 in fiscal year 2009/10. Similarly maximum inflation rate 9.9% citing in fiscal year 2015/16 and 2011/12 and minimum inflation rate of 4.2% in fiscal year 2017/18.

Table 4.10 Analysis of macro environment variables

	Minimum	Maximum	Mean	Std. Deviation
INF	4.2	9.9	7.5364	2.25977
GDP	4.4	5.12	4.7636	0.23619

Note: SPSS result

Table 4.10 demonstrates descriptive statistics; mean, maximum value, minimum value and standard deviation of each year's macroeconomic variables, namely nominal GDP and Inflation rate of eleven year sampled periods. It clearly shows the average GDP is Rs. 4.76 which ranges from Rs. 4.40 to Rs.5.12. The standard deviation is 0.236. The average inflation rate is 7.53% which ranges from 4.20% to 9.90% and standard deviation is 2.25.

4.1.2 Descriptive analysis for the overall variables

Table 4.11 Overall descriptive analysis

Variables	Minimum	Maximum	Mean	Std. Deviation
CAR	-29.46	27.54	9.95	6.42389
SoNPL	0	10.91	1.6	1.94515
Bank size	15.79	19.4	18.0233	0.8104
Deposit	15.57	19.26	17.839	0.80072
GDP	4.4	5.12	4.7499	0.22061
Inflation	4.2	9.9	7.62	2.16238
L ₁	0.0764	0.4421	0.20872	0.07456
L ₂	0.0793	0.5084	0.24803	0.08676

Note: SPSS result

Table 4.11 showing overall descriptive statistic-mean, maximum and minimum values and standard deviation of L₁, L₂ and various selected independent variables. The mean value of L1 is 0.208 during the period 2009/10 to 2019/20. The standard deviation of L₁ is 5.445% which show average variation from its mean value calculated from L₁ ratio during the period. The minimum and maximum values are 0.0764 and 0.4421. The determinants of liquidity are measured by liquid assets/ (Short term deposit +borrowing) indicating by L₂ show that mean value is 0.248

which is slightly higher than mean value of L_1 with the maximum value of L_2 is 0.5084 and minimum value is 0.079. There is slightly higher dispersion of L_2 towards its mean value among banks that is shown by standard deviation is 8.67%

On the one hand there are micro economic variables that cause to differentiate in liquidity level of organizations. Here in table the capital adequacy ratio shows the proportion of owner's equity to total risk weighted assets. The mean value of CAR is 9.95% which is higher than minimum requirement of 10% Nepal Rastra Bank's directives 2016 and Basel II requirements. The standard deviation of the CAR is 6.42% which is moderate variation. The minimum and maximum values of CAR are -29.46% and 27.54% respectively. Where minimum percentage of share of non-performing minimum value is almost zero ranging to 10.91 percentage leading to 1.6 percentage of mean value which have standard deviation of 1.945. The bank size signified by $\log_{10} \text{Total assets}$ varies from a minimum value of 15.79 to maximum value of 19.40 leading to an average of 18.0233. The standard deviation of bank size is 0.810 from mean value. Likewise, the $\log_{10} \text{Deposit}$ varies from minimum 15.57 to maximum 19.26 leading to average of 17.83. The standard deviation is 0.8007.

On the other hand remaining independent variables were the macroeconomic indicators. The mean value of $\log_{10} \text{GDP}$ was 4.749 indicating the average real GDP of the country's economy over the past 10 years. The maximum GDP of the economy was 5.12 and the minimum was 4.40. The general inflation rate is 7.62 percent of the country on average over the past ten years. The maximum inflation was 9.90% and the minimum were 4.2%, leading to standard deviation of 2.16%. This indicates that the rate of inflation is little dispersed over the periods under study. Here liquid assets to total assets ratio (L_1) and liquid assets to deposits and borrowing ratio (L_2) are the independent measures the liquidity.

4.2 Statistical analysis

4.2.1 Correlation analysis

Correlation is a statistical technique that can show whether and how strongly pairs of variables which can numerically related continuous variables. An intelligence

correlation analysis can lead to greater understanding the data with measuring, degree to which two or more variables are associated with or related to each other or not.

For correlation analysis we can measure four types of correlations namely Pearson, Kendall rank, Spearman and Point-biserial correlation. Among of them the most widely used bi-variant correlation statistics is the Pearson product-movement coefficient, commonly called the Pearson correlation which was used in this study. Correlation coefficient between two variables ranges from +1 (i.e. perfect positive relationship) to -1 (i.e. perfect negative relationship). The size of absolute value indicates the strength of relationship, where 0= no relationship and 1 indicated that the value of one variable can be exactly determined by knowing the value of other. Subsequently, the sample size is the key element to determine whether or not the correlation coefficient is different from zero/statistically significant.

Table 4.12 Pearson correlation between (liquid assets/total assets) and (liquid assets/ deposit + borrowing) and independent variable

		L ₁	L ₂	CAR	SoNPL	Bank size	Dep	GDP	Inf
L ₁	Pearson Correlation	1							
	Sig. (2-tailed)								
L ₂	Pearson Correlation	.938**	1						
	Sig. (2-tailed)	0							
CAR	Pearson Correlation	-.202*	-0.071	1					
	Sig. (2-tailed)	0.036	0.494						
SoNPL	Pearson Correlation	.295**	0.164	-.746**	1				
	Sig. (2-tailed)	0.004	0.112	0					
Banksiz	Pearson Correlation	-0.068	0.014	-0.186	.222*	1			
	Sig. (2-tailed)	0.514	0.89	0.071	0.03				
Deposit	Pearson Correlation	-0.044	-0.013	-.237*	.271**	.987**	1		
	Sig. (2-tailed)	0.67	0.9	0.021	0.008	0			
GDP	Pearson Correlation	-.350**	-0.187	.216*	-0.121	.789**	.747**	1	
	Sig. (2-tailed)	0	0.07	0.036	0.241	0	0		
Inflation	Pearson Correlation	.330**	0.161	-0.195	0.119	-.588**	-.533**	-.761**	1
	Sig. (2-tailed)	0.001	0.12	0.058	0.249	0	0	0	

Note: SPSS result

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

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

Table 4.12 demonstrates the Bivariate Pearson's correlation coefficient between level of liquidity measures by L_1 and L_2 and variables affecting its' liquidity level. It shows that L_1 is positively correlated with share of non-performing loan and inflation rate with value of 0.295 and 0.33 respectively, having medium degree of strength in relationship. Here in both case significance level is less than 0.15 so, both correlation is statistically significant. In contrast L_1 is negatively correlated with CAR, bank size, deposit and GDP with the negative value of 0.202, 0.068, 0.044, indicating weaker level of strength in relationship, 0.35 with GDP indicates medium level of strength of relationship. Whereas L_2 have positive correlated with share of non-performing loan, bank size and inflation rate with values of 0.164, 0.014 and 0.161 respectively, indicating weaker level of strength in relationship, L_2 have negatively correlation with, CAR, amount of deposit and GDP with the coefficient of 0.071, 0.013 and 0.187 respectively, indicating weaker level of strength in relationship.

According to L_1 as well as L_2 share of non-performing loan, inflation rate has positive relationship with banks liquidity in Nepal with having positive sign of Pearson correlation. This shows that increase in share of non-performing loan and inflation rate leads to increase in liquidity and vice versa.

According to L_1 and L_2 showing CAR, amount of deposit and GDP has negative relationship with bank liquidity in Nepal having negative Pearson correlation value. This shows that change in CAR, amount of deposit and GDP cause to inverse change in liquidity level of Nepalese commercial banks.

However, accordance to above table L_1 and L_2 shows contradictory results regarding relationship between liquidity and bank size.

Accordance to above table L_1 and L_2 has statistically significant and positive linear relationship with correlation of 0.938. It observes high degree of correlation between dependent variables.

4.2.2 Regression analysis

Regression analysis is a statistical tool applied for the investigation of relationships between variables. The purpose of regression analysis is to predict an outcome based on historical data. So it can be said that various independent variables can be use for predicting the behavior of dependent variable based on the behavior of few/more no. of independent variables. There are various types of regression analysis among of them linear regression is one of the most widely known modeling technique.

The regression of determinants of liquidity in Nepalese commercial bank has been analyzed by L_1 and L_2 . During this analysis, model summary has been presented to identify the explanation of independent variables on dependent variables and ANOVA analysis is done to test the significance of the model and the joint effect of independent variables on dependent variable.

Regression analysis is further carried to test the validity of tally with the result obtained from correlation analysis, test hypothesis and to test multiple regression models.

4.2.2.1 Model summary

The model summary gives the total variability in the dependent variable explained by the model. This indicates the percentage of the variability in the dependent variable explained by factors not included on the study. The regression model for L_1 is $L_{1it} = \beta_0 + \beta_1(CAR)_{it} + \beta_2 \log_5(TA)_{it} + \beta_3 \log_5(DEP)_{it} + \beta_4 \log_{10}(GDP)_{it} + \beta_5(INF)_{it} + \beta_6(SONPL)_{it} + \epsilon_{it}$ and L_2 has also has its model stated, $L_{2it} = \beta_0 + \beta_1(CAR)_{it} + \beta_2 \log_5(TA)_{it} + \beta_3 \log_5(DEP)_{it} + \beta_4 \log_{10}(GDP)_{it} + \beta_5(INF)_{it} + \beta_6(SONPL)_{it} + \epsilon_{it}$.

Real gross domestic product (\log_{10} of real GDP in millions rupees), bank size (\log_5 of total assets in millions rupees inflation (INF in percentage) and deposit (\log_5 of deposit) are independent variables and determinants of liquidity is measures by liquid asset/total assets and liquid assets/ (deposit+ borrowing) are considered dependent variables.

Table 4.13 Model summary liquid assets/total assets (L₁)

Model Summary ^b				
	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.528 ^a	0.279	0.229	0.065452

Note: SPSS result

- a. Dependent variable: Liquid asset/total assets
- b. Predictors: (Constant), inflation rate, share of non-performing loan, bank size, capital adequacy ratio, GDP, deposit

Table 4.13 demonstrates the model summary. Here, multiple correlation coefficient $R = 0.528$ indicates that there was a high degree positive correlation between CAR, share of non-performing loan, bank size, GDP, deposit level and inflation liquidity measured by L_1 . The value R-Square is 0.279, indicates that 27.9% of variations in liquidity can explained by independent variables included in the model. However, the remaining 72.1% variation in liquidity caused by others independent variables that are not included in the model.

Table 4.14 Model summary liquid assets/ (borrowing+ deposit) (L₂)

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.518 ^a	.269	.219	.07669

Note: SPSS result

- a. Dependent variable: liquid asset/ (deposit+ borrowing)
- b. Predictors: (Constant), inflation, share of non-performing loan, bank size, capital adequacy ratio, GDP, deposit

Table 4.14 demonstrates the model summary. Here, multiple correlation coefficient $R = .506$ indicated that there is strong positive correlation between CAR, share of non-performing loan, bank size, GDP, deposit and inflation rate on liquidity measured by L_2 in Nepali commercial banks. Also, the value R-Square is 0.256, indicates that 25.6% of variations in liquidity can explained by independent variables included in

the model. However, the remaining 74.4% variation in liquidity caused by others independent variables that are not included in the model.

4.2.2.2 ANOVA

The study sought to establish analysis of variance (ANOVA) which was a collection of statistical models used to analyze the differences among group means and their association. The ANOVA statistical presentation was used to present the regression model significance.

Table 4.15 ANOVA test on liquid asset by total assets

ANOVA ^a					
Model	Sum of Squares	D f	Mean Square	F	Sig.
Regression	0.146	6	0.024	5.662	.000 ^b
Residual	0.377	88	0.004		
Total	0.523	94			

Note: SPSS result

- a. Dependent variable: liquid asset/total assets
- b. Predictors: (Constant), inflation, share of non-performing loan, bank size, capital adequacy ratio, GDP, deposit

Table 4.15 consists of ANOVA. In the table significance value is 0.000 which is less than alpha value 0.050. Therefore the model is a good predictor of the relationship between the dependent and Independent Variables. As a result, the independent variables CAR, share of non-performing loan, bank Size, GDP, inflation, deposit and dependent variables liquidity measure by L_1 is significant in explaining the variance between independent variables and dependent variables.

Table 4.16 ANOVA test on liquid asset by deposit+ borrowing

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	0.19	6	0.03	5.385	.000 ^b
Residual	0.518	88	0.006		
Total	0.708	94			

Note: SPSS result

- a. Dependent variable: liquid asset /(deposit+ borrowing)
- b. Predictors: (Constant), inflation, share of non-performing loan, bank size, capital adequacy ratio, GDP, deposit

Table 4.16 shows the ANOVA. Here, the significance value is 0.000 which is less than alpha value 0.050. Therefore the model is a good predictor of the relationship between the dependent and independent variables. As a result, the independent variables namely CAR, share of non-performing loan, bank Size, GDP, inflation, deposit and dependent variables liquidity measured by L_2 is significant in explaining the variance between independent variables and dependent variables.

4.2.2.3 Regression coefficient

The results are based on panel data of 9 Nepalese commercial banks with 99 observations for the period of 2008/09 to 2019/20 by using linear regression model. The following panel regression models were estimated;

$$L_{1it} = \beta_0 + \beta_1(CAR)_{it} + \beta_2 \log_5(TA)_{it} + \beta_3 \log_5(DEP)_{it} + \beta_4 \log_{10}(GDP)_{it} \\ + \beta_5(INF)_{it} + \beta_6(SONPL)_{it} + \epsilon_{it}$$

$$L_{2it} = \beta_0 + \beta_1(CAR)_{it} + \beta_2 \log_5(TA)_{it} + \beta_3 \log_5(DEP)_{it} + \beta_4 \log_{10}(GDP)_{it} \\ + \beta_5(INF)_{it} + \beta_6(SONPL)_{it} + \epsilon_{it}$$

L_1 = Liquid assets/ total assets L_2 = Liquid assets /deposit+ borrowing, CAR=Capital adequacy ratio, share of NPL=share of NPL, BS= Bank size, GDP= Real Gross Domestic Product, INF= Inflation, DE= Deposit ϵ = Error item, β_0 =Constant, i =Commercial banks and t = index of time periods $\beta_1\beta_2\beta_3\beta_4\beta_5\beta_6$ are parameters to be estimated.

Table 4.17 Regression coefficient liquid asset /total asset and affecting factors

Model	Unstandardized		Standardized	T	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	0.339	0.26		1.304	0.196
CAR	0.003	0.002	0.232	1.609	0.1
SoNPL	0.01	0.005	0.258	1.851	0.068
Bank size	0.081	0.062	0.882	1.308	0.194
Deposit	-0.03	0.06	-0.327	-0.511	0.61
GDP	-0.238	0.071	-0.704	-3.36	0.001
Inflation	0.005	0.005	0.145	1.008	0.316

Note: SPSS result

- a. Dependent variable: liquid asset/total assets
- b. Predictors: (Constant), inflation, share of non-performing loan, bank size, capital adequacy ratio, GDP, deposit

Table 4.17 demonstrates the result to identify whether the independent variables are statistically significant taking significance level of 0.10 and direction of relation. Here in table, value of 'p' of SONPL and GDP are less than significance level 0.10 with value of 0.10, 0.068 and 0.01 respectively so they are statistically significant with liquidity measured by L_1 , but bank size, deposit and inflation rate have higher 'p' value then significance level with values of 0.194, 0.610 and 0.318 so they are statistically insignificant with liquidity measured by L_1 .

In the row of un-standardized coefficient the value of 'B' indicates positive or negative changes in dependent variable cause of a unit change in independent variables. Here, CAR had positive value of 'B' coefficient of 0.03 indicates positive relation between CAR and liquidity level measured by L_1 and indicates 1% change in CAR will cause 0.03% change in liquidity level. The 'B' value of SONPL is positive 0.010 indicates a percentage change in SONPL will cause 0.010% change in liquidity level and has a positive relation with liquidity. Same way 'B' value of bank size and inflation rate have positive value of 0.081 and 0.05 which indicates increase in amount of deposit by Rs. 1 and 1% will cause increase in liquidity level by Rs. 0.081

and 0.05% respectively. On the other hand 'B' values of amount of deposit and GDP are -0.030 and -0.238 respectively. We can conclude that Rs. 1 change in deposit will cause inverse change in liquidity by Rs. 0.030 and same way Rs 1 increase in amount of GDP will cause decrease in liquidity level by Rs. 0.238 and vice versa.

Table 4.18 Regression coefficient for liquid asset/ deposit + borrowing and affecting factors

Model	Coefficients ^a				T	Sig.
	Unstandardized		Standardized			
	B	Std. Error	Beta			
(Constant)	0.256	0.304			0.842	0.402
CAR	0.003	0.002	0.258		1.774	0.08
SoNPL	0.01	0.006	0.214		1.1523	0.131
Bank size	0.306	0.073	2.858		4.209	0
Deposit	-0.24	0.07	-2.211		-3.434	0.001
GDP	-0.283	0.083	-0.721		-3.417	0.001
Inflation	0.006	0.006	0.155		1.07	0.288

Note: SPSS result

- a. Dependent variable: liquid asset/ (deposit+ borrowing)
- b. Predictors: (Constant), inflation, share of non-performing loan, bank size, capital adequacy ratio, GDP, deposit

Table 4.18 demonstrates the result to identify whether the independent variables are statistically significant taking significance level of 0.10 and direction of relation. Here in table, value of 'p' of CAR, bank size, deposit amount and GDP are less than significance level 0.10 with value of 0.080, 0.000, 0.001 and 0.001 respectively so they are statistically significant with liquidity measured by L_2 but SoNPL and inflation rate have higher 'p' value then significance level with values of 0.131 and 0.288 so they are statistically insignificant with liquidity measured by L_2 .

In the row of un-standardized coefficient the value of 'B' indicates positive or negative changes in dependent variable cause of a unit change in independent variables. On the one hand, here CAR had positive value of 'B' coefficient of 0.003

indicates positive relation between CAR and liquidity level measured by L_2 and 1% change in CAR will cause 0.003% proportionate change in liquidity level. The 'B' value of SONPL is positive 0.010 indicates a percentage change in SONPL will cause 0.010% proportionate change in liquidity level and has a positive relation with liquidity. Same way 'B' value of bank size and inflation rate have positive value of 0.306 and 0.006 which indicates increase in amount of deposit by Rs. 1 and 1% will cause increase in liquidity level by Rs. 0.306 and 0.006% respectively. On the other hand 'B' values of amount of deposit and GDP are -0.240 and -0.283 respectively. It can be said that Rs. 1 change in deposit will cause inverse change in liquidity by Rs. 0.240 and same way Rs 1 increase in amount of GDP will cause decrease in liquidity level by Rs. 0.283 and vice versa.

4.3 Major findings

This study attempts to analyze the Determinants of liquidity of the commercial banks in Nepal. More specifically, the study aims to examine the Relationship between of bank specific and macroeconomic variables on selected commercial bank liquidity in the case of Nepal of the period of 2009/10 to 2019/20. This study has taken liquid asset /total asset and liquid asset/(deposit and borrowing) to measure the liquidity of Nepal by selecting the bank specific variables stated, CAR, share of non-performing loan, bank size, deposit and macro-economic variables, GDP and inflation. In this study, the findings from descriptive statistics, correlation analysis, ANOVA test and linear regression model assumption were presented as follows.

1. The descriptive result showed that the dependent variable, liquid assets /total assets of sampled Nepalese commercial banks are found ranging from 7.64 percent to 44.21 percent with an average of 20.87 percent. Liquid Assets/Deposit+ Borrowing is found ranging from 7.93 percent to 50.84 percent with an average of 24.80 percent. Hence, this showed that standard deviation from mean of liquid assets/ deposit+ borrowing is greater than that of Liquid Assets/Total Assets with 8.67 of L_2 versus 7.45 of L_1 .
2. Similarly, the independent variables, capital adequacy ratio is found ranging from -29.46 percent to 27.54 percent with an average of 9.95 with SD of 6.423. The capital adequacy ratio has negative minimum

value (-29) due to loss in governments bank i.e. Rastriya Banijya Bank Ltd. during the study period. Share of nonperforming loan is ranging from almost 0 to 10.91 leading to mean 1.60 and SD of 1.945. Similarly bank size is found ranging from 15.79 to 19.40 which have average of 18.02 with SD of 0.8104. Also the amount of deposit is found ranging from 15.57 to 19.26 which have average of 17.83 with SD of 0.8007. Likewise, GDP is found ranging from 4.40 to 5.12 leading to an average of 4.7499 with SD of 0.2206 from mean. Inflation is found ranging from 4.2 percent to 9.9 percent leading to an average of 7.62 percent with SD of 2.162 percent from mean.

3. According to liquid assets/total assets as well as (liquid assets/ deposit + borrowing) share of non-performing loan and inflation rate has positive relationship with banks liquidity in Nepal having positive sign of Pearson correlation having. They have value of 0.295, 0.164, 0.330 and 0.161. This shows that increase in share of non-performing loan, amount of deposit and inflation rate would lead to increase in liquidity level and vice versa.
4. Similarly, according to liquid assets/total assets and liquid assets/deposit+ borrowing capital adequacy ratio, bank size, and GDP has negative relationship with bank liquidity in Nepal having negative Pearson correlation containing the value of 0.202 and 0.071, 0.068 and 0.014 and finally 0.350 and 0.187 respectively. This shows that change in capital adequacy ratio, amount of deposit and GDP will lead to inverse change in liquidity level and vice versa. In case of bank size those two models give contradictory results regarding direction of changes in variable compared to liquidity measured by L_1 and L_2 .
5. The findings also revealed that the value of R square on liquid assets /total assets is 0.279 which means that around 27.9 percent variation in liquid assets/total assets is explained by the regression equation involving independent variables; CAR, share of non-performing loan, bank size, deposit, real GDP and inflation. The ANOVA test showed F- value of 5.662 which is also significant at 10% level.
6. The findings also revealed that the value of R square on liquid assets (deposit+ borrowing) is 0.269 which means that around 26.9 percent

variation in liquid assets / (deposit+ borrowing) is explained by the regression equation involving independent variables CAR, share of nonperforming loan, bank size, deposit, real GDP and inflation. The ANOVA test showed F-value of 5.38 which is also significant at 10% level of significance.

7. Similarly, the regression model on liquid assets/total assets and liquid assets/ deposit + borrowing both revealed that the beta coefficient for CAR, share of non-performing loan, bank size and inflation rate are positive having value of 0.003 and 0.003, 0.01 and 0.01, 0.081 and 0.306 and finally 0.005 and 0.006 respectively. Similarly, for the amount of deposit and GDP regression coefficients are negative having negative value of 0.03 and 0.24 and finally 0.238 and 0.283 by L_2 respectively. But in analyzing significance level resulted L_1 and L_2 , have some conflicting results. Accordance to L_1 model capital adequacy ratio, share of non-performing loan and GDP are only statistically significant with liquidity. But according to L_2 model other than inflation rate, all of the independent variables are statistically significant with liquidity.

4.4 Discussion

Bank needs capital in order to lend or they risk becoming insolvent. Lending creates deposit, but not all deposit arise from lending bank need liquidity when deposit is drawn or they risk running out of money therefore liquidity creation is the function of commercial banks. Rational decision maker makes optimal level of liquidity so that firm can generate enough cash requirement to meet firm's needs and don't make money ideal. The aim of this study was to identify degree of effects in determining the liquidity level of commercial banks in Nepal by selected independent variables and prefer some recommendation to bank's management and researcher. This study used independent variables: capital adequacy ratio, share of non-performing loan, bank size, deposit, GDP and inflation while the dependent variable is liquidity measured by assets/total assets (L_1) and liquid asset/deposit+ borrowing (L_2). Study is carried out on the selected 9 Nepalese commercial banks over the period of 2009/2010 to

2019/2020. The result of this study somehow in line and against the findings of the literatures that have been reviewed which are discussed below.

Based on L_1 model

The result reveals that there is significant influence of CAR, SONPL and real GDP on liquidity level measures by L_1 model. In case of significance and direction of relation, Those findings, in case of CAR and SONPL, are consistent with the findings of Vodova, (2010) and Ojha, (2016) in case of SONPL Subedi & Neupane, (2013) also. But, lower the CAR higher would be the liquid assets by total assets, “financial fragility-crowding out” theories, this result is inconsistent with these theories but consistence with risk absorption strategies. The study also reveals that negative beta coefficient for real GDP. This indicates that higher the real GDP lower would be the liquid assets by total assets. This finding is consistent with the theory of bank liquidity and financial fragility but oppose to loan able fund theory. This finding is consistent in case of significance with finding of Aspachs, (2005) but just oppose resulted in terms of direction of relation. The result reveals that there is positive and insignificant influence of deposit amount, bank size and inflation rate on liquidity level. This finding is inconsistent with the findings of Claire, (2021) and Bist, (2018) in terms of deposit amount. The relation between bank size and liquidity level, accordance to this study, accept the concept of “too big to fail” approach and consistent with the findings of Khanal, (2019) and just oppose to finding of Tseganesh, (2012 and Berger and Bouwman, (2009).

Based on L_2 model

The result reveals that there is significant influence of CAR, bank size deposit amount and real GDP on liquidity level measures by L_2 model. In case of significance and direction of relation, those findings, in case of CAR and bank size, are consistent with the findings of Bist, (2018) but in terms of significance, bank size result is inconsistency with Moussa, (2015). This study result is inconsistency in case of SONPL, but consistence in terms of GDP and CAR with the result of Ojha, (2016). But, lower the CAR higher would be the liquid assets by total assets, “financial fragility-crowding out” theories, this result is inconsistent with this theory but consistence with risk absorption strategies. This finding is consistent with the findings

of Claire, (2021) and Bist, (2018) in terms of deposit amount. Result of this study rejected the concept of “too big to fail” approach and just in line to the finding of Rauch, (2008) and Berger and Bouwman, (2009) in terms of relation between bank size and liquidity level. In terms of relation between bank size and liquidity level, result accepted the findings of Huybens, (1998) and Smith, (1999). The study also reveals that negative beta coefficient for real GDP. This indicates that higher the real GDP lower would be the liquid assets by total assets. This finding is consistent with the theory of bank liquidity and financial fragility but oppose to loan able fund theory. This finding is consistent in case of significance with finding of Aspachs, (2005) but just oppose resulted in terms of direction of relation. The result reveals that there is positive and insignificant influence of SONPL and inflation rate on liquidity level. This finding is consistent with the findings of Joshi, (2016).

CHAPTER V

SUMMARY AND CONCLUSION

This chapter presents the brief summary of the entire study. In addition, the major conclusions are discussed based on the findings of the study in separate section of this chapter which is followed by some recommendations regarding the determinants of liquidity commercial banks in Nepal. Finally, the chapter ends with the scope of the future studies in the same field.

5.1 Summary

Banks and financial institutions should have to maintain balanced level of liquidity in efficient and effective manner and policymakers can affect their effort in constructive way. The management of bank and financial policy makers then needs to decide how they can do best to maintain balanced level of liquidity without incurring substantial losses. Study have proposed that all managements of bank and policy makers should have to do close evaluation to the relationship between liquidity and its determinants variable which may be inside of the commercial banks or may be outside of the commercial banks. So they can find significance and direction of relation that will certainly helpful for proactive management of liquidity level and invest to the liquidity in beneficial way. This study have been done for the purpose of assess and examine the significance and direction of relation with selected bank's specific and macro economics variables with liquidity of commercial banks of Nepal. For that purpose nine commercial banks are taken in consideration of the period of 2008/09 to 2019/20. Liquidity of these banks has been analytically tested here to compare with bank's other specific and macro-economic factors likes SoNPL, CAR, deposit amount, bank size, GDP and inflation rate. Data were collected from mainly secondary sources has been analyzed with the use of different financial, descriptive and statistical tools namely, average, standard deviation, correlation coefficient, coefficient of variation, correlation coefficient, ANOVA and regression analysis considering the limitation of sample size, time frame, sources of data, analyzing tools etc.. More specifically Statistical package for social science (SPSS) software is used to compute the data and to get the required information and results. This study is considering the rationality to proactive management of liquidity in commercial banks of Nepal.

The finding of the study shows that, in relation to liquidity measured by L_1 ; CAR, SoNPL and GDP have significant impact on the determining the liquidity in Nepalese commercial banks, but bank size, deposit and inflation rate has insignificant impact. CAR, SoNPL, bank size and inflation rate have positive coefficient, but deposit and GDP have negative coefficient. Similar significant positive result found by Vodova, (2010) and Ojha, (2016) in case of CAR and SONPL. This studies' result accepts the theory of "bank liquidity and financial fragility" but oppose to "loan able fund theory" in terms of GDP. Result based on bank size accept the concept of "too big to fail" approach. Same as this study similar positive insignificant result was found by Bista, (2018) in terms of inflation and bank size but result is against to the sayings of Huybens, (1998) in case of inflation. The result is line with finding of Bunda & Desquilbet, (2008) of CAR but oppose in terms of GDP and inflation. Findings Khanal, (2019) is totally against of the finding of this study. On the other hand, in determinants of liquidity measured by L_2 ; CAR, bank size, deposit amount and GDP have significant impact on the determinants of liquidity Nepalese commercial banks, but inflation and SoNPL have insignificant impact. CAR, SoNPL, bank size and inflation rate have positive coefficient, but deposit and GDP have negative coefficient. Similar significant positive result found by Vodova, (2010) and Ojha, (2016), also line with "Risk Absorption" theory in direction of relation in case of CAR. This studies' result accepts the theory of bank liquidity and financial fragility but oppose to loan able fund theory in terms of GDP. The result is line with finding of Bunda & Desquilbet, (2008) of CAR but oppose in terms of GDP and inflation. Result based on deposit amount accepts the concept by Claire, (2021). Same as this study, similar positive relation with liquidity is stated by Iannotta, (2007) and "too big to fail" theory in term of bank size. The result of study is in line with the finding of Subedi and Neupane (2013) but just oppose to the finding of Gautam, (2014) in terms of SoNPL.

5.2 Conclusions

The results of this study suggest that bank specific and macroeconomic variables have an imperatively significant role on banks liquidity level in Nepal. The major conclusions are mentioning below:

Conclusion based on L₁ model

Coefficient of CAR, SoNPL and GDP are significant but bank size, deposit and inflation rate have insignificant.

Further CAR and SoNPL only have positive impact on liquidity and GDP have inverse relation.

Conclusion based on L₂ model

CAR, bank size, deposit amount and GDP have significant relation in determining liquidity level. Among of them CAR and bank size have positive relation with liquidity level but deposit amount and GDP have negative relation.

SoNPL and Inflation rate both have insignificant and positive relation with liquidity level in the commercial bank of Nepal.

5.3 Implications

The implications of this study will make some contribution to manager of commercial banks, commercial bank regulator or policy maker and supports for future researchers in this field. The implication would be different based on priority of management but the result of this study could be helpful to maintain desirable liquidity level of BFIS. The study of this paper suggest following recommendations to BFIS's, Policy makers and for further researchers.

5.3.1 Implication to the management of commercial bank

Based on L₁ model

This study reveals that among the selected independent variables CAR, SoNPL and GDP have the significant relation with liquidity level of commercial banks of Nepal. So, management of commercial bank has to consider these variables in order to managing the liquidity level. Among these variables percentage increase in GDP has negative impact on liquidity level of commercial banks of Nepal. The monetary policy maker should need to implement suitable policy measures to ease liquidity during fiscal year with high economic growth. On the same way, commercial banks ought to invest in productive sectors. On the other hands, SoNPL have positive impact

on liquidity level of commercial banks of Nepal. Which means that bank should need to decrease SoNPL to ease liquidity level, for that purpose banks need to introduce new consumers oriented scheme of lending and borrowing, this is always desirable for the sound health of bank also. Further sufficient CAR is desirable but for control increasing liquidity level banks should keep investment in less risky assets.

Bank size, deposit and inflation rate seems no significant impact on liquidity level of commercial banks of Nepal. So there is no need to consider Bank size, deposit and inflation seriously while determining the liquidity level in commercial banks of Nepal.

Based on L_2 model

This study reveals that among of the selected independent variables CAR, bank size, deposit and GDP have the significant relation with liquidity level of commercial banks of Nepal. So management of commercial bank have to take consider these variables while managing the liquidity level. Among of the independent variables having significant impact, GDP and deposit are found to having negative repressors to liquidity level of commercial banks of Nepal. So management of commercial bank of Nepal should have to increase investment in productive sector so GDP would be increases. On the same way deposit amount should be increases for controlling increasing liquidity level for that purpose banks need to introduce new consumer oriented scheme of lending. On the other hand, among of the independent variables having significant effect, CAR and bank size are positive repressors to the liquidity level of commercial banks of Nepal. For management of commercial banks of Nepal, it is essential to decrease in CAR and bank size, in turn increasing in liquidity level and vice versa. Sufficient CAR is desirable but for control increasing liquidity level banks should keep investment in less risky assets. Increase in total assets is normal but for control increasing liquidity level banks should try to decrease in assets.

SoNPL and inflation rate seems to get insignificant relation with liquidity level of commercial banks of Nepal, so SoNPL and Inflation rate wouldn't be consider while determining the liquidity level in commercial banks of Nepal.

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5.3.2 Implication for future researchers

The study reveals the relationship between liquidity level and limited independent variables. Future researchers can be carried out the research using other specific and macro economical variables. This study is limited to the analysis of secondary data. Future researcher can be done using primary data with more samples which may result different result. This study covered only commercial banks in Nepal. It didn't consider other financial institutions and other sector to provide broad based analysis. Future researchers can conduct relation between liquidity and factors affects to the liquidity of other financial institution of Nepal except commercial banks.

5.4 Areas for the further research

The recommended areas for future research are mentioned below:

- The future researchers could replicate the study but consider other methods of analysis such as Hausman Test, VAR Model, Co-integration analysis and observe if the results would be different.
- The liquidity of the bank also depends upon the impact of rules and regulations of central bank, character of the bank, short term interest effect, etc. which this study has not studied. Thus, further study can be carried out with such factors through the primary data.
- Even though the study is carried out by taking sample of commercial banks only. The further researches can include samples of development bank and other financial institutions more number of observations to obtain the various determinants of liquidity.
- The study was only limited to six variables that affect the liquidity level in Nepalese commercial banks. Thus, more research could be done to determine the factors like : management efficiency, credit risk, real interest rate, interbank transaction etc that may affect liquidity level.

Annex I

Bank's wise Collection of data related to Capital Adequacy Ratio (CAR)

Fiscal year	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDHARTHA	NIBL	NABIL	Everest
2009/10	12.66	17.61	9.78	-29.46	15.56	10.01	8.5	8.77	8.39
2010/11	11.34	15.31	13.66	-22.28	27.54	9.05	8.77	8.83	8.46
2011/12	9.91	13.95	12.65	-9.77	19.82	8.18	9.34	9.3	9.61
2012/13	12.21	10.42	11.88	1.51	13.91	8.28	10.01	9.98	9.31
2013/14	11.84	9.91	11.53	4.46	11.52	8.39	9.52	9.68	9.35
2014/15	10.53	8.84	11.29	10.16	10.13	7.58	9.54	10.18	10.44
2015/16	10.69	9.34	10.76	9.31	10.69	8.78	13.05	10.51	10.34
2016/17	12.38	12.39	12.45	9.15	14.07	11.02	11.58	11.21	12.58
2017/18	8.66	14.78	11.43	9.98	11.14	10.99	11.58	11.81	12.65
2018/19	8.24	11.81	12.45	13.39	10.63	10.11	N/A	11.58	12.38
2019/20	8.12	12.8	10.78	12.68	10.37	9.26	N/A	10.69	11.92

Annex II**Bank's wise Collection of data related to Bank's size****(Rs. in Thousand)**

Fiscal year	EVEREST	NABIL	NIBL	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDHARTHA
2009/10	41382760	52151684	57305413	15543572	13226578	20218830	67910654	7238558	22802429
2010/11	46236212	58141437	58356827	17699569	15948192	22086102	74880374	9363380	24405872
2011/12	55813129	63193414	65756231	17871019	18494830	27157976	93905093	13722466	29579198
2012/13	65741150	73241260	73152154	45822344	25125984	32409183	101523505	21976539	33653855
2013/14	70445082	90292964	86173927	51500485	30211663	38030964	122557920	29376986	40277752
2014/15	99167293	118695997	104345436	60519399	41337463	45800892	139560806	40301197	50647295
2015/16	114018921	131347288	134516966	83573552	78864969	54408913	172058371	56128555	76124947
2016/17	116945280	144017861	155361353	103108261	93074422	77786847	179074721	69481703	91586102
2017/18	144811151	160978071	171893546	170943177	112391430	95043979	197332000	91821952	119869218
2018/19	170077533	N/A	N/A	217702263	135470410	102255829	226410177	109064487	151401764
2019/20	185023189	N/A	N/A	251852885	179423373	152182993	266390912	126310981	182468449

Annex III
Bank's wise Collection of data related to Deposit
(Rs. in Thousands)

Fiscal year	EVEREST	NABIL	NIBL	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDH
2009/10	36932310	46410701	50094725	12480760	10110689	17883518	68625869	5760495	20197029
2010/11	41127914	49696113	50138122	13677364	12866221	18938902	73941297	6356737	21575653
2011/12	50006100	55023695	57010603	15351206	15982555	23990952	87782195	11178734	25948505
2012/13	57720464	63609808	62428845	39908774	22185626	28798028	91093908	17789329	28392822
2013/14	62108135	75360769	73831375	44984218	27087258	34045262	107269942	24873849	35414007
2014/15	83093789	103957095	90631486	53477184	36722917	41005754	124221662	34045316	44740731
2015/16	91638884	109288114	99353328	139578561	63452888	43745461	139259011	41664487	57772206
2016/17	94091892	117436362	118921049	79906602	72317666	59680088	146587041	56161055	71415816
2017/18	115611705	134810669	136585576	64606790	83970867	72635987	164210303	77849380	94579591
2018/19	129568152	N/A	N/A	177374678	96641516	77040074	189255335	89373729	114923367
2019/20	143545475	N/A	N/A	201630384	131660368	119441613	230827711	107250202	139609497

Annex IV

Bank's wise Collection of data related to Share of Non-performing Loan

Fiscal year	EVEREST	NABIL	NIBL	NIC ASIA	NMB	PRIME	RBB	SANIMA	SIDDHARTHA
2009/10	0.16	1.48	0.67	0.72	0.7	0	9.81	0.08	0.53
2010/11	0.34	1.77	0.94	0.6	0.27	0.57	10.91	0.004	0.79
2011/12	0.84	2.33	3.32	0.73	2.45	0.76	7.27	0.479	1.52
2012/13	0.62	2.13	1.91	2.32	1.8	2.23	5.32	0.03	2.39
2013/14	0.2	2.23	1.77	2.33	0.55	2.43	4.75	0.017	2.75
2014/15	0.25	1.82	1.25	2.07	0.42	1.83	3.77	0.07	1.8
2015/16	0.38	1.14	0.88	0.76	1.81	1.23	4.25	0.019	1.47
2016/17	0.66	0.8	0.83	0.36	1.68	0.88	5.35	0.01	1.09
2017/18	0.97	0.55	1.36	0.06	0.88	0.85	6.38	0.03	1.3
2018/19	0.16	0.74		0.46	0.06	0.88	4.79	0.08	0.75
2019/20	0.22	0.97	N/A	0.75	1.63	1.23	4.08	0.45	1.38

Annex V

Collection of data related to macro economic variable

Fiscal year	GDP(Millions)	INF(%)
2009/10	1,192.80	9.6
2010/11	1,367	8.3
2011/12	1527.3	9.9
2012/13	1,695	9.1
2013/14	1964.5	9.1
2014/15	2130.1	7.2
2015/16	2,253.16	9.9
2016/17	2674.49	4.5
2017/18	3044.93	4.2
2018/19	3458.79	4.6
2019/20	3767.04	6.5

Annex VI

Calculation of L₁ and L₂ of Everest bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L₁	L₂
2009/10	41382760	37336910	10564090	0.255278	0.2829396
2010/11	46236212	41609914	10868350	0.235061	0.2611962
2011/12	55813129	50006100	12337055	0.221042	0.246711
2012/13	65741150	58122824	19420882	0.295414	0.3341352
2013/14	70445082	62108135	22619702	0.321097	0.3641987
2014/15	99167293	83093789	42242635	0.425973	0.508373
2015/16	114018921	91638884	36473411	0.319889	0.3980124
2016/17	116945280	94091892	35960571	0.307499	0.3821857
2017/18	144811151	115611705	51233916	0.353798	0.4431551
2018/19	170077533	129568152	33098404	0.194608	0.2554517
2019/20	185023189	143545475	32744821	0.176977	0.2281146

Put the values in formula we get value of L₁ and L₂

Annex VII

Calculation of L₁ and L₂ of NABIL bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L₁	L₂
2009/10	52151684	46485601	10414282	0.199692	0.2240324
2010/11	58141437	51346712	11379016	0.195713	0.2216114
2011/12	63193414	55334775	9596852	0.151865	0.1734326
2012/13	73241260	63609808	12120798	0.165491	0.1905492
2013/14	90292964	75360769	19397681	0.21483	0.2573976
2014/15	118695997	103957095	26908300	0.226699	0.2588404
2015/16	131347288	109288114	38110758	0.290153	0.3487182
2016/17	144017861	117436362	40675096	0.282431	0.3463586
2017/18	160978071	134810669	27192866	0.168923	0.2017115
2018/19	N/A	N/A	N/A	-	-
2019/20	N/A	N/A	N/A	-	-

Put the values in formula we get value of L₁ and L₂

Annex VIII

Calculation of L₁ and L₂ of NIBL

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit(000)	Liquidity(000)	L ₁	L ₂
2009/10	57,305,413	50094725	10727738	0.1872029	0.214149
2010/11	58356827	50,138,122	11854970	0.2031462	0.236446
2011/12	65756231	57010603	17292072	0.2629724	0.303313
2012/13	73152154	62428845	18618451	0.2545168	0.298235
2013/14	86173927	73831375	20588511	0.2389181	0.278859
2014/15	104345436	90631486	23378130	0.2240455	0.257947
2015/16	134516966	99353328	30858976	0.2294058	0.310598
2016/17	155361353	118921049	35535061	0.2287252	0.298812
2017/18	171893546	136585576	33225142	0.1932891	0.243255
2018/19	N/A	N/A	N/A	-	-
2019/20	N/A	N/A	N/A	-	-

Put the values in formula we get value of L₁ and L₂

Annex IX

Calculation of L₁ and L₂ of NIC ASIA bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L₁	L₂
2009/10	15543572	13357200	2631606	0.169305	0.1970178
2010/11	17699569	14667364	4062645	0.229534	0.2769854
2011/12	17871019	15351206	2665942	0.149177	0.1736634
2012/13	45822344	40112791	8857318	0.193297	0.2208103
2013/14	51500485	44984218	10958212	0.212779	0.2436013
2014/15	60519399	53477184	10092140	0.166759	0.1887186
2015/16	83573552	139578561	11068571	0.132441	0.0792999
2016/17	103108261	79906602	17227237	0.167079	0.2155922
2017/18	170943177	64606790	26420461	0.154557	0.4089425
2018/19	217702263	177374678	24307148	0.111653	0.1370384
2019/20	251852885	201630384	36696405	0.145706	0.1819984

Put the values in formula we get value of L₁ and L₂

Annex X

Calculation of L₁ and L₂ of NMB bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L₁	L₂
2009/10	13226578	10490944	3149889	0.238148	0.3002484
2010/11	15948192	13363421	2616360	0.164054	0.1957852
2011/12	18494830	15982555	4724549	0.255452	0.2956066
2012/13	25125984	22185626	6315774	0.251364	0.2846786
2013/14	30211663	27087258	5961640	0.197329	0.2200902
2014/15	41337463	37160917	9880368	0.239017	0.2658806
2015/16	78864969	63563582	13477559	0.170894	0.2120327
2016/17	93074422	72373013	16651912	0.17891	0.2300845
2017/18	112391430	83970867	13114721	0.116688	0.1561818
2018/19	135470410	96641516	21098504	0.155743	0.2183172
2019/20	179423373	131660368	29655456	0.165282	0.2252421

Put the values in formula we get value of L₁ and L₂

Annex XI

Calculation of L_1 and L_2 of Prime bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$

$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L_1	L_2
2009/10	20218830	18332318	5191016	0.256742	0.283162
2010/11	22086102	19152022	4199604	0.190147	0.2192773
2011/12	27157976	24013002	7457120	0.274583	0.3105451
2012/13	32409183	29018376	9525577	0.293916	0.3282602
2013/14	38030964	34045262	9395769	0.247056	0.2759788
2014/15	45800892	41005754	10891266	0.237796	0.2656034
2015/16	54408913	43745461	9983870	0.183497	0.2282264
2016/17	77786847	59680088	14590922	0.187576	0.2444856
2017/18	95043979	72635987	16065345	0.169031	0.2211761
2018/19	102255829	77040074	14231473	0.139175	0.1847282
2019/20	152182993	119441613	21356232	0.140333	0.1788006

Put the values in formula and we get value of L_1 and L_2

Annex XII

Calculation of L₁ and L₂ of RBB bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$
$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L₁	L₂
2009/10	67910654	72665660	17045557	0.251	0.2345751
2010/11	74880374	78754099	16392410	0.218915	0.2081468
2011/12	93905093	90705321	38168238	0.406455	0.4207938
2012/13	101523505	93261083	41713837	0.410879	0.4472802
2013/14	122557920	109048542	54177200	0.442054	0.4968173
2014/15	139560806	125527000	37200122	0.266551	0.2963516
2015/16	172058371	139666721	58470236	0.339828	0.4186411
2016/17	179074721	146750917	47333523	0.264323	0.3225433
2017/18	197332000	164381799	47549595	0.240962	0.2892631
2018/19	226410177	189316022	20928465	0.092436	0.1105478
2019/20	266390912	266450976	25047665	0.094026	0.0940048

Put the values in formula and we get value of L₁ and L₂

Annex XIII

Calculation of L₁ and L₂ of SANIMA bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$
$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L₁	L₂
2009/10	7238558	6205295	1568284	0.216657	0.2527332
2010/11	9363380	7014737	2189169	0.233801	0.3120814
2011/12	13722466	11266984	3283627	0.239288	0.291438
2012/13	21976539	19269455	5405406	0.245963	0.2805168
2013/14	29376986	25772117	5312510	0.180839	0.206134
2014/15	40301197	35732501	4147555	0.102914	0.1160723
2015/16	56128555	41664487	6654982	0.118567	0.1597279
2016/17	69481703	56161055	9196023	0.132352	0.1637438
2017/18	91821952	77849380	10787308	0.117481	0.1385664
2018/19	109064487	89373729	8330383	0.07638	0.0932084
2019/20	126310981	107250202	13383289	0.105955	0.1247857

Put the values in formula and we get value of L₁ and L₂

Annex XIV

Calculation of L₁ and L₂ of SIDDARTHA bank

Here:

$$L_1 = \frac{\text{Liquid Assets}}{\text{Total Assets}}$$
$$L_2 = \frac{\text{Liquid Assets}}{\text{Deposit+Borrowing}}$$

Fiscal years	Bank size(000)	Deposit+borrowing	Liquidity(000)	L ₁	L ₂
2009/10	22802429	20542029	4116024	0.180508	0.2003709
2010/11	24405872	21620653	3862808	0.158274	0.1786629
2011/12	29579198	25993505	5448281	0.184193	0.2096016
2012/13	33653855	29180287	7157035	0.212666	0.2452695
2013/14	40277752	35520422	8407045	0.208727	0.236682
2014/15	50647295	44805731	7141195	0.140999	0.1593813
2015/16	76124947	57772206	7986134	0.104908	0.1382349
2016/17	91586102	71415816	11119535	0.121411	0.1557013
2017/18	119869218	94579591	12519271	0.104441	0.1323676
2018/19	151401764	114923367	22548909	0.148934	0.1962082
2019/20	182468449	139609497	28507050	0.15623	0.2041913

Put the values in formula and we get value of L₁ and L₂

DETERMINANTS OF LIQUIDITY OF COMMERCIAL BANKS OF NEPAL

A Thesis Proposal Submitted to the Office of the Dean, Faculty of Management in partial fulfillment of the requirements for the Master's Degree

By

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CHAPTER I

Introduction

1.1 Background of the Study

Financial sector is the backbone of economy of a country. It works as a facilitator for achieving sustained economic growth through providing efficient monetary intermediation. A strong financial system promotes investment by financing productive business opportunities, mobilizing savings, efficiently allocating resources and makes easy the trade of goods and services. Several studies have reported that the efficacy of a financial system to reduce information and transaction costs plays an important role in determining the rate of savings, investment decisions, technological innovations and hence the rate of economic growth. There are various factors that positively or negatively affects to success of various organizations, so as to commercial banks, among of them managing appropriate level of liquidity level have core importance.

“Liquid asset means the cash balance of a bank or financial institution, the balance remained in the current account, the balance maintained in Rastra Bank and such assets of a bank or financial institution specified as liquid assets by the Rastra Bank from time to time.” (Bank and Financial Institution Act, 2017).

Liquidity for a bank means the ability to meet its financial obligations as they come due. Bank lending finances investments in relatively illiquid assets, but it funds its loans with mostly short term liabilities. Thus one of the main challenges to a bank is ensuring its own liquidity under all reasonable conditions. A bank's liquidity is determined by its ability to meet all its anticipated expenses, such as funding loans or making payments on debt, using only liquid assets. The attention has been paid by lender to the last resort to overcome the liquidity crisis (Aspachs, et. Al. Nier, Tiesset, 2005).

Bank for International Settlements defines liquidity as the ability of bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses. The management of any firm should be able to identify its strength and weakness, likewise exploit opportunities and tackle threats as it is determined to make profits.

Liquidity can be defined as the ability of a financial institution to meet all legitimate demands for funds. A bank needs to hold liquid assets to meet the cash requirements of its customers if

the institution does not have the resources to satisfy its customers' demand, then it either has to borrow on the inter-bank market or the central bank. If bank unable to meet its customers' demands leaves itself exposed to a run and more importantly, a systemic lack of confidence in the banking system (Yeager and Seitz, 1989).

Liquidity means allocation of funds in close relation to their respective sources. Liquidity is the status and part of the assets which can be used to meet the obligation in the commercial banks. Liquidity can be viewed in terms of liquidity stored in the balance sheet and in terms of liquidity available through purchased funds. Liquidity is the ability of a bank to pay cash to depositors on demand. It is the arrangement and the allocation of funds in such a way that can be drawn immediately without any loss of principle. More specifically, the idle money does not make any return. Therefore, the high liquidity may cause a flow profitability and inefficient performance of the overall Banking sector. It may cause failure of banking performance in long term (Pandey, 2000).

As other organization higher profitability is ultimate aim of commercial banks. One factor that affect profitability is qualitative management of liquidity. In the same way there are various factors that affect level of liquidity. Based on the review of above discussion and given definitions, liquidity is the ability of a financial institution to meet all legitimate demands for funds which is the specific topic of study. It plays a pivotal role in the successful operation in any business. In case of bank, it means stored in the balance sheet and in terms of liquidity available through purchased funds, ability of a bank to pay cash to depositors on demand, amount of money that can drawn in urgent need. While managing level of liquidity organization have to bear risks namely funding and market liquidity risk. Organizations have to manage liquidity level tactfully for achieving the goal.

1.2 Statement of the Problems

One of the major investment of commercial banks is liquidity. On every investment there should be considerable return to investors, so as to the commercial banks' liquidity investment. Investment in liquidity cheap or expensive depends upon the carefulness of liquidity management. Liquidity investment is always essential and equally risky as well. If they know about the exact factors that influencing the liquidity level, they will invest in liquidity confidently. It is unpredictable to specify what factors determine the liquidity level. There should be consider the external and internal factors before determining the level of investment in liquidity (pandey, 2000).

Banks and financial institutions should have to maintain balanced level of liquidity in efficient and effective manner and policymakers can affect their effort in constructive way. The management of bank and financial policy makers then needs to decide how they can do best to maintain balanced level of liquidity in their respective area. I propose that all managements of bank and policy makers should have to do close evaluation to the relationship between liquidity and its independent variable which may be inside the commercial banks or may be outside of the commercial banks. So they can find significance and direction of relation that will certainly helpful for proactive management of liquidity level and invest to the liquidity in beneficial way.

Vodova, (2011) aimed to identified the determinants of liquidity of commercial banks by using the Czech republic's Commercial Bank data controlled by independent variables of capital adequacy, share of non-performing loans, interest rates on interbank transaction, inflation rate, business cycle financial crisis and size of banks and explore significance positive relation between bank liquidity and capital adequacy, share of non-performing loans, interest rates on interbank loans transaction, negative influence of inflation rate, business cycle and financial crisis on liquidity. According to his findings, the relation between size of banks and their liquidity is ambiguous. In this context, this study will try to identify the determinants of liquidity and find out the degree of affection of those determinants and to know about liquidity behavior. More specifically, this present study will carry out to answer the following research question:

1. What are the determinants of liquidity in commercial banks of Nepal?
2. What is the relationship between bank specific variables and macro-economic variables on liquidity of commercial banks in Nepal?
3. What are the effects of bank's specific variables and macro-economical variables on liquidity of commercial banks in Nepal?

1.3 Purpose of the Study

This study aims to analyze determinants of liquidity of commercial banks and their relationship with the liquidity based on information available in Nepalese context. The objectives of this study will examine the impact of the determinants of the liquidity of Nepalese commercial bank. The specific objectives of the study are listed as below:

1. To assess the determinants of liquidity in commercial banks of Nepal.
2. To examine the relationship between bank's specific variables and macro-economic variables on liquidity of commercial banks of Nepal.
3. To examine the effect of bank's specific variables and macro-economical variables on liquidity of commercial banks in Nepal.

1.4 Significance of the Study

The study deals with determinants of level of liquidity in commercial banks of Nepal. The study also significance lies mainly in identifying and comparing the determinants factors of liquidity. Banks can use recommendation of this study for proactive management. It will provide the real picture of ongoing condition which is beneficial to potential as well as existing shareholders, about identifying risk return and make decisions of utilizing funds. The study will also useful for depositors, merchant bankers as well as other stakeholders; they can identify the overall performance and ongoing liquidity risk of the banks. It will be helpful to those who want to conduct further study in this field. Mainly, the proposed study will be significance for the researchers, research group and academicians for the future in the view of review.

1.5 Limitations of the Study

The limitations of the study are:

1. The research only concentrates on determinants factors of level of liquidity in commercial banks in Nepal.
2. Data only collected through secondary sources, does not include the preference of different stakeholders.
3. The sample size and time period taken for the study is only covering nine banks and eleven years.
4. The model used in this study and analysis is limited on some quantitative methods.
5. This study only used IBM SPSS software analysis tools.
6. Result of this study may differ according to different state of nature and time.

1.6 Organization of the Study

The whole study will divide into five chapters and the chapters are organized systematically as follows for the effective study.

Chapter I: This chapter will consist of major issues to investigate along with the objective, significance, focus and limitation of the study.

Chapter II: This chapter will be related to theoretical analysis a brief review of related literature. It tries to show overall scenario of determinants of liquidity level, its determinants and their effect in financial performance, especially analysis of commercial banks of Nepal.

Chapter III: This section will describe the methodology employed in the study. This chapter deals with the nature and sources of data selection for study areas, method of analysis etc

Chapter IV: This chapter will deal with the presentation and analysis of data and major findings by using proper tools and techniques.

Chapter V: The last chapter incorporated summary, conclusion and recommendation emanating from the study.