DETERMINANTS OF LIQUIDITY IN COMMERCIAL BANKS IN NEPAL

A Thesis

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By

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DECLARATION

I hereby declare that this thesis entitled DETERMINANTS OF LIQUIDITY IN COMMERCIAL BANKS IN NEPAL submitted to the Faculty of Humanities and Social Sciences, Department of Economics, Patan Multiple Campus embodies the result of an original research work in the form of partial fulfilment of the requirement of MASTER of ARTS in ECONOMICS. This study has not been submitted for candidature for any other degree.

Prabin Rai

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LETTER OF RECOMMENDATION

The thesis entitled DETERMINANTS OF LIQUIDITY IN COMMERCIAL BANKS LIQUIDIY IN NEPAL has been prepared by **Mr. PRABIN RAI** under my guidance and supervision. I hereby, recommend it in partial fulfillment of the requirement for the Degree of MASTERS of ARTS in ECONOMICS for final examination.

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LETTER OF APPROVAL

We certify that this thesis entitled DETERMINANTS OF LIQUIDITY IN COMMERCIAL BANKS IN NEPAL submitted by **Mr. PRABIN RAI** to the Department of Economics, Faculty of Humanities and Social Sciences, Patan Multiple Campus, Tribhuvan University, in partial fulfillment of the requirements of Degree of MASTER OF ARTS in ECONOMICS has been found satisfactory in scope and quality. Therefore, we accept this thesis as a part of the said degree.

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ABSTRACT

The objective of study is to analyze trend of bank liquidity, to examine the relationship and effects of bank specific variables and macro-economic variables on liquidity and to examine the determinants of liquidity. The auto regressive distributed lag model has been employed including unit root, bound test for cointegration and error correction model using all commercial banks quarterly data covering the period from Oct 2006 to July 2021. The bank's liquidity was taken as a dependent variable which functioned against both bank specific and macroeconomic determinants. The study shows that growth in liquidity was observed to be relatively slow in compared to other independent variables such as deposit, loan, capital, assets, money supply, government expenditure, remittance and public debt. the trend line of bank liquidity in the commercial banks is instable, fluctuating and declining. The results revealed that banks assets and remittances are the statistically significant determinant of commercial bank's liquidity in Nepal. It was also found that the remittance, bank's assets, banks deposit and remittance is positively related to bank's liquidity. On the contrary, the results revealed a negative relationship of commercial bank's liquidity with banks credit, banks capital, money supply, government expenditure and public debt. Remittances (macro-economic variables (counter variables)) was observed to have more significant impact on commercial banks liquidity in Nepal in comparison to banks assets (micro-economic variables (core variables) of banks liquidity.

This study has significant implication for bankers, consumers and policymakers. The banking sector of Nepalese will highly be benefited from this research as this paper critically analyses the determinants of commercial bank's liquidity. This study infers that the central bank of Nepal needs to implement a tight monetary policy and other necessary laws to bring the unwelcome effects of inflation on Nepalese banks liquidity and to route all of the remittance in the national economy through banking channels and banks also needs to monitor the factors cautiously in order to maintain acceptable levels of liquidity and to avoid the liquidity crisis in the future. Regulatory authority must consider the bank specific factors for liquidity management and also needs to implement tight monetary policy as per the market situation in order to reduce money supply.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ADF	Augmented Dickey Fuller
ANOVA	Analysis of Variance
ARDL	Auto Regressive Distributed Lag
ASEQ	Assets Quality
AST	Assets
BSE	Bombay Stock Exchange
BFIs	Bank and Financial Institutions
BLUE	Best Linear Unbiased Estimator
CA	Capital
CAR	Capital Adequacy Ratio
CEE	Capital and Eastern European
CRD	Credit
CUSUM	Cumulative Sum
CUSUMSQ	Cumulative Sum Squared
DB	Domestic Borrowing
DEP	Deposit
ECM	Error Correction Model
FMOLS	Fully Modified Ordinary Lest Square
GDP	Gross Domestic Product
GMM	Generalized Methods of Moments
GOVEX	Government Expenditure
IBR	Inter Bank Rate
ILTL	Impaired Loan to Total Loans
INF	Inflation
KPSS	Kwiatkowski Philips Schmidt Shin Test
LIQ	Liquidity

M2	Money Supply
MENA	Middle East and North Africa
NPL	Non-Performing Loan
NRB	Nepal Rastra Bank
OLS	Ordinary Least Square
P-P	Phillip Perron
RBI	Reserve Bank of India
RESET	Regression Equation Specification Error Test
ROA	Return on Assets
ROBOR	Romanian Inter Bank Operating Rate
ROE	Return on Equity
RMT	Remittance
SIZE	Bank Size
TCR	Total Capital Ratio

CHAPTER – I

INTRODUCTION

1.1   Background of the Study

Liquidity can be understood in terms of flows (as opposed to stocks), in other words, it is a flow concept. Liquidity refers to the unhindered flows among the agents of the financial system, with a particular focus on the flows among the central bank, commercial banks and markets. Liquidity also refers to the ability of realizing these flows. Within the financial system of one can distinguish three broad liquidity types namely central bank liquidity, funding liquidity and market liquidity. The linkage among these liquidity types is complex, dynamic and strong and can have positive or negative effects on financial stability. In order to eliminate systemic liquidity risk, greater transparency of liquidity management practices is needed. Supervision and regulation are the fundamental weapons against systematic liquidity crises (Nikolaou, 2009).

More cash reserve reduce the vulnerability of banks to liquidity risks that arise from granting depositors the option to withdraw their funds. Liquidity risk is of two types, exogeneous (where withdrawal behavior is unrelated to depositor's beliefs about bank conditions) and endogenous (where withdrawals reflect deterioration in banks conditions). Banks that hold sufficient cash are able to gain market confidence in their risk management, and thereby attract and retain deposits. Combination of a larger amount of short-term debt and a high cash reserve requirement is efficient and superior to regulatory rule that would encourage lower levels of both (Calomiris, Heider & Hoerova, 2015).

The economy of any country heavily relies on the financial system of the country as it plays a crucial role of liquidity transformation in the economy. Bank, being the most important player of the financial system, have always been a source of attention for the economic and finance enthusiasts. Any malfunctioning in the banking industry can lead to extremely costly consequences for the economy.

To survive in the financial system, banks are required to have an unprecedented amount of liquidity assistance from central banks, central bank regulations also greatly affect the

liquidity position of commercial bank and tight monetary policy is needed to control the undesirable effects of inflation on liquidity (Malik & Rafique, 2013). Although the central bank supported extensively, evidence found that a significant number of bank failures and afterward those banks were necessitated to merge or indispensable to resolution. This crisis pushed to convert the market circumstances and consequently demonstrated the significance of maintaining adequate liquidity management.

The position of the banking system is significantly crucial for growing and developing the economy. One of the most significant rules of the bank is to meet the customer's demand and other expenses by ensuring adequate reserve of liquidity for smooth functioning of banking operation as economic development is highly reliable in banking sector. Maintaining an optimal level of liquidity is the highest concern to create an efficient banking system as well as keep the banks away from insolvency or lower profitability otherwise it will destroy the shareholder's wealth and consequently the whole financial system framework.

It is difficult to disburse funds immediately after banks collect them from depositors, bank may temporarily invest in liquid assets sources that they could substitute by loans later. Storing more liquidity is a greater motivation for banks to expand lending subsequently. Bank capital, asset quality, liquidity and market risk resilience significantly contribute to the bank's capacity to sustain lending activities. Bank with poorer management efficiency tend to expand lending faster than better managed banks (Nguyen & Dang, 2020).

Liquidity of Moroccan bank's has decreased during last decade. The decline has been increased since 2007 with the financial crisis. The Financial has a negative impact on Moroccan bank's liquidity. Large banks are more liquid than small banks. Size is a key determinants of bank liquidity (Ferrouhi, & Lahadiri, 2014).

Liquidity is commercial bank's ability to fund increases in assets and meet obligations as they come due, without bearing undesirable losses Vodova (2013). Liquidity in bank is determined by host of factors. Some factors are banks specific while macroeconomic factors also affect banks liquidity. Probability of obtaining the support from lender of last resort, which should lower the incentive for holding liquid assets, interest margin as a measure of opportunity costs of holding liquid assets, bank profitability, which is according

to finance theory negatively correlated with liquidity, loan growth, where higher loan growth signals increase in illiquid assets, size of the bank, gross domestic product growth as an indicator of business cycle and short term interest rate, which should capture the monetary effect affect bank liquidity (Vodova, 2011).

Bank liquidity is the ability of a bank to meet its immediate commitments. Bank acts as liquidity providers and financial intermediaries in a financial system. This is accomplished by mobilizing funds (short-term deposits/ liabilities) from the surplus unit (savers) and making use of the funds for financing the deficit units (borrowers) in form of loans and investments (long term assets). At times, banks as liquidity provider may unexpectedly experience extreme shortages of liquidity which could be triggered by larger amount of standby credit drawn or/ and unexpected reduction in the availability of deposits. Banks must meet their due obligation and execute payments on the exact day they are due, otherwise, the banks stand the risk of being declared illiquid (Crockett, 2008).

Liquid assets include cash and bank balances, money at call and short notice, placement up to 90 days and investment in government securities. Borrowing repayable up to 90 days is deducted from liquid assets to obtain net liquid assets (NRB, 2078).

Banks needs to maintain conservative levels of liquidity in order to protect themselves against large, unexpected calls for cash. Liquidity risk arises from the fundamental role of banks in the maturity mismatch of the assets and liability. It is entirely possible for the economic value of a bank's assets to more than sufficient to cover all of its claims and yet for that bank to go bust because its assets are illiquid and its liabilities have short term maturities (Elliott, 2014).

Liquidity and solvency are the heavenly twins of banking, frequently indistinguishable. An illiquid can rapidly become insolvent, and an insolvent bank illiquid. The more liquid, and instantly saleable at a steady price, are a bank's assets, the less the bank needs to worry about its maturity transformation, since it can pay off withdrawn liabilities with the proceeds of assets sale. The less the maturity transformation, the less does a bank need to worry about the interim interest rate and market risk on its assets, since it can hold the assets until maturity, and ride out any intervening market squalls. Thus, both sides of the

bank's book have to be taken into account at the same time in order to assess its overall liquidity (Goodhart, 2008).

Lending behavior of bank generally depends on type of bank, the capital base, the deposit base, density of the deposit, interest rate, exchange rate, inflation, gross domestic product, investment portfolio, liquidity, monetary and fiscal phenomena, the credit guidelines issue from time to time by the regulatory authority and internal policies of the banks as well as other non-economic factors. There are supply side and demand side factors determining the bank's lending behavior. The study focuses on supply side factors.

One of the motives for studying the variables that impact significantly on banks liquidity is of the view about the major role that banking sector plays in economic life since the economy depends mainly on banks, as they are the main financers of economic development of the nation.

In the recent times, BFIs in Nepal are experiencing mounting challenges in liquidity management as they have been struggling with the ongoing shortage of liquidity. This problem has been recurrent since 2010 after which BFIs are facing acute shortage of cash time and again. The year following 2010 have witnessed such recurrences in high and low magnitudes with a depending of the crisis in the last couple of years. Liquidity crunch is a common occurrence in Nepal due to the Nepalese Rupee (NR) being a non-convertible currency and a heavy trade deficit. The growing liquidity crisis in Nepal has emerged in the wake of increased credit disbursements to encourage economic activity in the country and foster economic recovery. An increase in credit disbursement has not been meet with a comparable increase in deposits. Bank and Financial have run out of loanable fund and the decision to raise internal loans by the government for development activities are pending. A lack of deposits within Banks and Financial Institutions is expected during the festival season, lasting from mid- October to mid- December. The period between mid-July and mid-January is generally associated with a lack of liquidity in the market, as direct and indirect taxation on individuals and corporation is due to the government during this period.

Many past research on matter relating to liquidity have attempted to provide impact of micro and macroeconomic factor on liquidity in international scenario but lacks empirical

evidence related to identifying the factors affecting liquidity in the Nepalese commercial bank and there is no time series study on bank specific and macroeconomic determinant of liquidity in case of Nepalese banking system. In this context, by adding the empirical evidence on the key factors explaining the liquidity of the Nepalese commercial banks, this study aims to provide valuable insight to both academicians and policy makers. The major beneficiaries of this study are all the stakeholders including regulators, policy makers, commercial banks, the academic staff and all other who are interested in the subject.

1.2 Statement of Problem

Bank should have ready access to immediately expendable funds at reasonable cost precisely at the time those funds are needed. Lack of adequate liquidity is considered the first signs that a bank is in serious financial trouble. In Nepal, total assets of Bank and Financial Institution in Mid-July 2021 is Rs. 6,036 billion, out of which total assets of commercial bank is Rs 5,392 billion. The coverage of the total assets of commercial bank, which is more than 89% of the total financial system, makes them the major player in Nepalese banking industry. Banks in Nepal have been facing liquidity problems in the last few years. There are instances where the banks face liquidity problem, which may lead to severe credit crunch and ultimately solvency problem. The problem seems to be recurrent with temporary ease in liquidity over the years. Bank liquidity management is important for individual bank as well as policymakers in safeguarding overall financial stability. Managing liquidity has become a big challenge for the BFIs in Nepal and maintaining interest rate within limit has become challenge for central bank. The lack of sufficient research on the factors affecting bank liquidity in the context of Nepal and the existence of knowledge gap in the area have initiated the urge to study and find out the factors that affect liquidity of banks in Nepal.

This study helps to identify the determinants that affect the liquidity of the commercial banks and help to minimize and manage the risks that arises from the liquidity problem timely. The study tires to find out the following research questions:

a) What is the trend of bank liquidity, bank specific and macroeconomic variables on the bank liquidity?

b) What is the relationship between liquidity and micro (bank specific) and macroeconomic variables?

1.3 Objectives of the Study

The general objective of this study is to analyze overall liquidity situation of BFIs in Nepal. The specific objectives of this study are as follows:

a) To analyze the trends of bank liquidity, bank specific and macro-economic variables on bank liquidity.

b) To examine the determinants of the liquidity position of commercial banks in Nepal.

1.4 Significance of the Study

Liquidity is an integral part of banking. Creating and managing liquidity is one of its main functions. Liquidity crunch is also becoming a frequent problem in financial sector in Nepal. Therefore, study of determinants of liquidity is important for Nepalese economy. Knowledge of determinants of liquidity and their significance will help in controlling and managing the risk that arises from liquidity issues in Commercial banks. The study contributes to the existing knowledge in the area of factors determining commercial banks liquidity and their relationships in the context of Nepal. The incorporation of macroeconomic variables such as government expenditure, domestic borrowing, money supply and remittance in this study would explore into the new avenues of investigating factors affecting liquidity for commercial banks. This study will contribute to wellbeing of the financial sector and eventually the entire economy. The study is helpful mostly to all the stakeholder in economy including regulators, policy makers, commercial banks, the academic staff and all others who are interested in the subject.

1.5 Limitations of the Study

This study is a requirement for the partial fulfillment of the degree of Master of Arts in Economics. Followings are the limitation of the study:

a) This study has covered only commercial banks of Nepal of Nepal among different types of BFIs.

b) The dataset consists of only 60 observations of 15 years quarterly data from 2006 October to 2021 July.

1.6   Outline of the Study

This study is organized into five chapters. Chapter one introduces the study which includes the background, problem statement including research questions and objectives, significance of study and limitations of the study and outline of the study. The second chapter deals with the review of literature. It includes a discussion on the review of the major empirical works and dissertation carried out by the different researchers and students. The third chapter presents the conceptual framework and research methodology that has been used in this study. It deals with research design, nature and sources of data, collection and processing of data and methods of data analysis. The review of related literature conducted in this chapter provides a framework for the study. The fourth chapter fulfills the objectives of the study by presenting the data and analyzing them with the help of various quantitative techniques. Finally, the fifth chapter summarizes the whole study. Moreover, it draws the major findings and conclusions. References for citations and appendices are included at the end of the study.

CHAPTER- II

REVIEW OF LITERATURE

This chapter focus on the literature review, which is conducted in order to create the framework for the study. This chapter focus on the past studies that focus on the subject matter. It involves analyzing and discussing the findings of other researchers in journals, researcher's report, textbooks and other publications on internal and external factors affecting bank liquidity and the gap that exists in past literature. Some of the major literature review that will be conducted as follows:

2.1 Empirical Review

2.1.1 International Context

Vodova (2011) made a comprehensive analysis of determinants of commercial banks liquidity in the Czech Republic using banks specific and macroeconomic data over the period from 2001 to 2009 and analyze them with panel data regression analysis. It was found that there is positive and statistically significant effect of capital adequacy, lending interest rate, inflation, GDP growth on liquidity of banks. The study also revealed that the presence of prudential regulation and financial crises showed negative and significant impact on bank liquidity position. However, the study shows that influence of bank size is ambiguous.

Munteanu (2012) examined the factors affecting bank liquidity in Romania through multiple regression model of panel of 27 commercial bank over the period 2002 to 2010. The study emphasized the differences between the pre-crisis year (2002-2007) and the crisis year 2008-2010. The dependent variable where liquidity measured by net loans total assets ratio and liquid assets deposit and short-term lending ratio. Independent variables were internal factors such as capital adequacy, assets quality, interbank funding, funding cost and cost to income ratio. External factors include interest rate ROBOR, credit risk rate, inflation rate, GDP real growth rate, unemployment. The study found that Tier I capital, impaired loans, interbank funding has negatively affected liquidity while cost to income ratio and credit risk rate has positively influenced liquidity. Similarly, unemployment has

positive effect in liquidity. The author cautions readers to carefully analyze the results since it is possible to be induced by certain circumstances.

Tesfaye (2012) investigated the determinants of liquidity of Banks in Ethiopia. The study used balanced fixed effect panel regression data of eight commercial banks in the sample covered the period from 2000 to 2011. The finding suggests that capital adequacy, bank size, share of non-performing 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.

Malik and Rafique (2013) examined the bank specific and macroeconomic determinants of commercial bank's liquidity in Pakistan. The sample of study consisted of 26 Pakistani commercial banks. The study period consisted of 5 years (2007 to 2011) period which also covered the period of the Asian financial crisis of 2008. The bank's liquidity was measured in two ways; once was cash and cash equivalents to total assets and second was advances net of provisions to total assets. The study estimated two models using panel data regression model. The study found that the bank specific fundamental (NPL and TOA) and monetary policy interest rate positively determine the bank liquidity whereas inflation had negative impact. Bank liquidity measured by liquidity to total assets was negatively and significantly affected by the financial crisis. The findings from the other model suggested that the bank size and monetary policy interest rate positively and significantly determined the bank liquidity. The study also found that the determinants of commercial banks in Pakistan indicated that the bank specific fundamental (non-performing loans to total loans and total assets of the bank) and monetary policy interest rate positively determined the bank liquidity whereas inflation and ROE had a negative impact and finally the study suggested that bank liquidity was also negatively affected by the financial crisis. The study recommended that banks must forecast the liquidity requirement to fulfill the requirement of anticipated events.

Chhon et al., (2013) in examined the determinants influencing the liquidity of Malaysian commercial banks and its implication for relevant bodies. The study included 15 Malaysian banks over the period 2003 to 2012. Using the fixed effect model framework to investigate

the effect bank specific factors (i.e. bank capital, bank size, non-performing loan ratio and profitability) as well as macroeconomic factors (i.e. interbank rate, GDP and financial crisis) that had impact on commercial bank liquidity, the study found that some of the bank specific factors (i.e. bank capital, bank size, non-performing loan ratio and profitability) as well as two of the three macroeconomic factors (i.e. GDP and financial crisis) had significant effects on the liquid assets holding of banks. The study found interbank rates to have insignificant effect on bank's liquid asset holding and recommended the Malaysian banks to use the model to estimate the amount of liquidity in order to survive and make decision making regarding the issue on liquidity and communicate it to the government to solve it together to increase the chance of surviving.

Lotto and Mwemezi (2015) studied the major determinants of bank liquidity. The study used the panel regression for secondary data extracted from published bank financial statements of 49 banks in the sample in Tanzania, covering the period from 2006 to 2013. The results revealed that capital adequacy, bank size and interest rate margin had a negative and statistically significant effect on bank's liquidity, while non-performing loans and inflation were found to have positive impact on bank's liquidity. On the other hand, the profitability and GDP growth rate had statistically insignificant impact on bank's liquidity, although they both had expected positive relationships. According to the study results smaller banks are more liquid because they mainly focus on short term loans that mature shortly, and are therefore are believed to be more liquid as compared to bigger banks that tie up most of their capital on long terms loans that mature after some years.

Roman and Sargu (2015) analyzed the determinants of the liquidity risk of a sample of banks operating in a series of CEE countries (Bulgaria, the Czech Republic, Hungary, Lativa, Lithuania, Poland, Romania) using bank specific factors over the period 2004 to 2011 and examined them employing an OLS regression analysis. The results research highlighted the negative impact that the depreciation of the loan portfolio had on the overall liquidity of the analyzed banks. The internal factors that have the most influence on the overall liquidity of the analyzed banks is the total capital ratio (TCR), the ratio of impaired loan to total loan (ILTL) and the return on average equity (ROAE), Notwithstanding, the impact of these indicators on the overall liquidity of the analyzed banks has been positive

in some cases and negative in others, depending on the local macroeconomic environment particularities.

Mugenyah (2015) explored the determinants of liquidity risk of commercial banks in Kenya. According to the author the study employed a descriptive research design. A census targeting the 43 commercial banks licensed in Kenya between 2010 and 2014 was conducted. The study used secondary data obtained from the Central Bank of Kenya website and the respective banks website. Multiple regression analysis was used to evaluate the determinants of liquidity risk. Capital adequacy ratio, liquid assets ratio, ownership type, size and leverage were regressed on loan to deposit ratio. Analysis of variance (ANOVA) was used to test significance of the regression result at 5% level. The result of regression indicated that capital adequacy had positive effect on liquidity risk while liquid assets ratio, ownership type, size and leverage had negative effect. The result of analysis of variance indicated that capital adequacy, liquid asset ratio, ownership type, size and leverage were significant determinants of liquidity risk at 5% significance level. The study concluded that capital adequacy ratio, liquid asset ratio, ownership type and leverage were significant determinants of liquidity risk. The study recommends that bank managers can effectively manage liquidity risk by collectively focusing on capital adequacy, liquid asset ratio, ownership type, size and leverage.

Singh and Sharma (2016) investigated the bank specific and macroeconomic factors that determined the liquidity of Indian banks. The study performed OLS, fixed effect and random effect estimates on a data set of 59 banks from 2000 to 2013. The bank specific factors included were bank size, profitability, cost of funding, capital adequacy and deposits. The macroeconomic factors included were GDP, inflation and unemployment. The finding revealed that bank ownership affected liquidity of banks. Based on panel data analysis, found that bank specific (except cost of funding) and macroeconomic (except unemployment) factors significantly affected bank liquidity. Those factors included bank size, deposits, profitability, capital adequacy, GDP and inflation. Further, bank size and GDP were found to have a negative effect on bank liquidity. On the other hand, deposits, profitability, capital adequacy and inflation showed a positive effect on bank liquidity. Cost of funding and unemployment showed an insignificant effect on bank liquidity. The study

recommended the highlights of new facts for enhanced understanding of liquidity in emerging economic like India would help the regulators and management of the banks to formulate policies and managerial undertakings.

Sheefeni and Nyambe (2016) studied the determinants of bank's liquidity in Namibia. The study considered and analyzed the macroeconomic determinants of commercial bank's liquidity in Namibia. The unit root, bound test for cointegration and error correction model were employed using quarterly data covering the period of 2001 to 2014. The results revealed that real gross domestic product is the main determinant of commercial bank's liquidity in Namibia. It was also found that monetary policy rate is positively related to bank's liquidity though statistically insignificant. On the contrary, the results revealed a negative relationship between inflation and commercial banks' liquidity.

Ahamad and Rasool (2017) investigated the determinants of commercial banks in Pakistan. Authors took a sample size of 31 listed commercial banks with state bank of Pakistan from a population of 37 commercial banks. A convenience sampling method is used to collect data for the period of 10 years, starting from 2005 up to 2014. The stock approach method was used to measure the bank liquidity. The results of balance fixed effect model showed that the independent variables like shareholders equity to total assets and GDP have positive and significant impact on bank liquidity while non-performing loan to gross advances and bank size have statistically significant and negative impact on bank liquidity. Subsequent authors found that ROE and inflation have statistically insignificant but positive relationship with bank liquidity.

Feng (2017) investigated the internal and external factor that affect the bank liquidity of commercial banks of China. The study used Pooled OLS model taking quarterly data of 10 commercial bank of China from 2007 to 2015. The study revealed that non-performing loan ratio and the capital adequacy ratio has a significant effect on liquidity ratio. The NPL ratio to Loan/Deposit ratio is negatively correlated, when commercial banks non-performing loan ratio increased, the LD ratio declined. Due to the increase in non-performing loans, commercial banks were unwilling to take on greater credit risk, so reduced the issuance of loans. Reduced loans directly led to LD ratio decreased, consistent calculation results of the model and the actual situation of the commercial bank. The capital

adequacy ratio to LD ratio was negatively correlated, when commercial banks capital adequacy ratio increased, the LD ratio declined. The loose degree of commercial banks own capital directly affected the liquidity of commercial banks. The study concluded that usually commercial banks own capital adequacy bank liquidity is more abundant, the lower the liquidity of their own banks are more tensed. The study recommended for the minimum requirement of capital adequacy ratio of commercial banks of the New Basel agreement to the role of escort for the liquidity risk of commercial banks.

Shah et al., (2018) examined the factors affecting liquidity of banks of Pakistan. The study used sample of 23 banks in Pakistan to study factors affecting liquidity of banks operating in Pakistan. Spanning from 2007 through 2016 the sample of the study includes 23 banks by employing relevant econometric specifications. The findings reveal that the internal factors such as capital adequacy ratio (CAR), cost of funds and bank size are statistically significant but differently related to the liquid asset to total assets ratio and to the total loans to total deposit ratio, respectively. The study funds that external or macro factors, such as GDP is statistically significant but affect liquidity of the banks differently. Unemployment, another external factor, also impact liquidity of banks very differently but it is statistically significant in the first measure of liquidity and statistically insignificant in the second measure of bank's liquidity. Further, the results revealed that profitability is insignificantly related to liquidity while the relationship between deposits and bank liquidity is negative and statistically significant.

AI-Homaidi et al., (2019) examined the liquidity determinants of Indian listed commercial bank. The study used the applied both GMM and pooled, fixed and random effect models to a panel of 37 commercial banks listed on the Bombay Stock Exchange (BSE) in India for the period from 2008 to 2017. The bank's liquidity was taken as a dependent variable which functioned against both bank specific and macroeconomic determinants. The results indicated that among the bank specific factor, bank size, capital adequacy ratio, deposits ratio, operation efficiency ratio and return on assets ratio, assets management ratio, return on equity ratio and net interest margin ratio are found to have a significant negative impact on Liquidity. With respect to macroeconomic factors, the results indicated that interest rate and exchange rate are found to have a significant effect on liquidity. The Reserve Bank of India (RBI) should give benchmarks for the above-mentioned ratios to achieve smooth

liquidity of commercial banks in India. The study recommended that bankers should consider assets quality in such a way that improves bank's performance.

Saha, et al., (2019) explored the factors associated with liquidity position of commercial banks in Bangladesh. The study used Fully Modified Ordinary Least Square (FMOLS), a recent version of panel cointegration method to identify the factors associated with liquidity position in Bangladesh. The study relied on data collected from 30 listed Bangladeshi commercial banks over the period of 2004 to 2014. The estimated results of the econometric model suggest that asset quality (ASEQ) and bank size (SIZE) negatively affect liquidity. The study recommends that commercial banks should go for new loan product development with less default risk and extend their loans in business with high growth potentials and less operational risks.

Al-Quadh. (2020) explored the impact of macroeconomic Real GDP growth (GDPG), inflation rate (INF) and bank specific variables profitability (ROA), capital adequacy (CADEQ), non-performing loan (NPL), deposit growth (DEPG) on the liquidity (LIQ) of 13 listed Jordanian commercial banks for the period 2011-2018. Panel data analysis, Pooled least square, fixed effects model and random effects model, Langrange multiplier test and Hausam test were used. The random effects model shown that macroeconomic variables have a significant impact on Jordanian commercial banks liquidity since inflation has a positive impact while GDPG has a negative impact on banks (LIQ). On the other hand, among the bank specific variables capital adequacy and deposit growth have a positive significant impact on banks (LIQ), while (NPL) and (Size) have a negative impact on Jordanian commercial banks liquidity. But ROA has a negative insignificant impact on (LIQ).

Ahamed (2021) examined the bank specific and external factors that affect the liquidity risk in commercial banks in Bangladesh. The study had been conducted using 23 banks data from 2005-2018 and panel data was used to conduct the regression analysis. In this study Hausman Test is conducted to confirm the Random Effect Model and Pooled Ordinary Least Square (POLS) has also been used in the study. Among the bank specific factors, asset size had a negative relationship with liquidity risk. The larger the bank size, the better the liquidity position and lower the liquidity risk. Return on equity and capital

adequacy had a positive but insignificant relationship with the liquidity risk. In the case of macroeconomic factors, inflation negatively affects the liquidity risks, whereas GDP and domestic credit positively affect. Private and public sector credits increase the investments which in turn fuel GDP growth. Growth in domestic credit reduces liquidity and may create insolvency. The loan outstanding to asset ratio is positively related to the liquidity risk of the banks. Banks usually increase the loan/advance disbursement to increase profitability, which dries out liquidity and enhances liquidity risk.

Tasnova (2022) examined the influences of bank specific and macroeconomic determinants on liquidity on 29 listed commercial banks of Bangladesh. The study performed Pooled Ordinary Least Square method, fixed and random effect estimates and implemented GLS random effect method on strongly balanced panel dataset over 2014 to 2019 to analyze the relationship. The study concluded that business cycle and monetary policy interest rate inversely affect bank liquidity. Contrary, bank liquidity had a positive association with profitability, non-performing loans, capital adequacy and interest rate spread. According to the findings of study, capital adequacy and business cycle have a significant impact on liquidity.

Mdaghir and Oubdi (2022) measured the liquidity creation of 153 banks in 12 MENA countries based on their on- and off-balance sheets for 2008-2017 and to determine the main internal (bank-specific) and external (macroeconomic) factors influencing bank liquidity creation in the MENA region. The study used a Fixed Effects (FE) model and new econometric approach based on the Method of Moments Quantile Regression (MMQR). The study found that sample bank created a total of $ 461.32 billion liquidity in 2017, approximately 1.51 times the total liquidity created in 2008. The result of the study shows that, among bank specific factors, bank risk, deposits and profitability whilst market concentration does not appear to play a significant role and regarding macroeconomic factors, inflation, unemployment, savings and monetary policy explain the variations in bank liquidity creation.

2.1.2 Nepalese Context

Subedi and Neupane (2013) investigated the determinants of bank liquidity and their influence on the financial performance in Nepalese commercial banks includes a study with

a sample of six commercial banks, using a primary data collection method in the form of a questionnaire, and a secondary data collection method in the form of statistics from the bank's annual financial statements. A multivariate linear regression model was used to include liquid asset to total assets ratio, loan to deposit and short-term financing and return on assets for the data covering the period 2002/2003 to 2011/2012. The results of regression analysis showed that capital adequacy, share of non-performing loans in the total volume of loans had negative and statistically significant impact on banks liquidity whereas loan growth, growth rate of gross domestic product on the basis price level, liquidity premium paid by borrowers and short-term interest rate had negative and statistically insignificant impact on banks liquidity.

Gautam (2016) investigated the determinants of the liquidity of Nepalese commercial bank used data collected from a sample of ten commercial banks in Nepal over the period from 2005 to 2014, author tested bank specific and macroeconomic variables applying least square regression model. The findings revealed that bank size, capital adequacy and inflation rate had a positive impact on liquidity, while nonperforming loans, profitability and GDP growth rate had negative impact on liquidity of Nepalese commercial banks. Capital adequacy, non-performing loan and profitability had statistically significant effect on the liquidity of Nepalese commercial banks whereas bank size, GDP growth rate and inflation rate have statistically insignificant impact on the liquidity of Nepalese commercial banks. The study concluded that capital adequacy, nonperforming loan, bank size, profitability, growth rate of GDP and inflation rate to be the major determinants of liquidity of the baking industry.

Joshi (2016) explored the idiosyncratic and macroeconomic determinants of liquidity of Nepalese commercial bank and examine the impact of interest margin, profitability, Tobin's Q, total assets, loan growth, gross domestic product, inflation and treasury bill rates on liquidity of commercial banks of Nepal. The study is based on the secondary data which were gather for 20 commercial banks in Nepal for the period 2007/08 to 2013/14, leading to the total of 140 observations. The study used pooled least square method to measure the relationship between bank liquidity with idiosyncratic and macroeconomic variable. The study concludes that major idiosyncratic and macro-economic determinants

of liquidity in Nepalese commercial banks are interest margin, Tobin's Q, profitability, gross domestic product and Treasury bill. The study shows that increase in interest margin, profitability, loan growth, total assets and Treasury bill rates leads to decrease in liquid assets divided by total assets whereas increase in Tobin's Q, gross domestic product and inflation leads to increase in liquid assets divided by total assets.

Sharma (2016) examined the determinants of bank's liquidity of Nepalese commercial banking sector uses the regression model to test the significance and importance of liquidity in Nepalese commercial banks based on 126 observations from 18 commercial banks in Nepal for a study period of 2007/08 to 2013/14. The result shows that there is positive relationship between return on assets, credit to deposit ratio and liquid assets to total assets ratio. The results also shows that there is negative relation between bank size, net interest margin, total deposit to total assets ratio and liquid assets to total assets ratio which reveals that increase in bank size will lower the liquid assets to total asset ratio. Similarly the study show that total loan to total asset ratio is positively correlated with capital adequacy ratio and credit to deposit ratio which indicates that higher the capital adequacy ratio, higher would be the total loan to total assets ratio.

Timsina (2017) studied the determinants of bank lending has used time series Ordinary Least Square regression approach to test and confirm effectiveness of the determinants of commercial bank lending behavior in Nepal using time series data of commercial banks of Nepal for the period of 1975 to 2014. The dependent variable was private sector credit and independent variables include GDP, credit, deposit, interest rate, inflation index, liquidity, CRR, exchange rate. The result shows that commercial bank's lending is mostly determined by the gross domestic product of the country and liquidity ratio to be maintained by the commercial bank. As there is significant positive relationship between GDP and private sector credit of commercial banks, they should take in to account the overall macroeconomic situation and factors affecting the GDP in general and their liquidity ratio in particular while taking lending decision.

Ojha (2018) examined the relationship between liquidity and bank specific variables in Nepalese commercial banks. The study included panel data of commercial banks from

2010/11 to 2016/17. Multiple regression analysis found that there was significant influence of ROA, ROE, NPL, GDP and IBR on liquidity and the form and pattern of liquidity, NPL, return on assets, CAR, return on equity, GDP, inflation and interbank rate in Nepalese commercial banks. The study concluded that higher the inter-bank rate lower would be the liquid assets by total assets.

Khati (2020) examined how liquidity influences the profitability of commercial banks of Nepal in order to offer insight for improving higher assets and legal responsibility control of banks in Nepal. The study involves ten out of twenty-seven commercial banks covering the period from 2013 to 2019. The data was analyzed by using correlation and fixed effect model run through E-views 8. The results of the study revealed that profitability ratio ROE has no relationship with those liquidity ratios. The study shows that assets quality has negative and significant relationship with return on assets whereas assets quality has positive and significant relationship with bank profitability, this indicates that increase in assets quality lead to increase return on equity `i.e., increase in liquidity ratios boots the bank profitability and vice-versa.

Bista and Basnet (2020) studied the determinants of bank liquidity of the commercial bank in Nepal. The study employed econometric model on 12 years long time series data base from 2004 to 2015. The study concluded that the bank liquidity of commercial bank has fluctuation and instable trend line indicating the risk of liquidity crunch. The study also revealed that deposit, capital adequacy, remittance and bank size are determinants of bank liquidity of commercial bank out of which deposit is prevalent to increase bank liquidity and capital adequacy to decrease it. The result of study shows that in long term, capital adequacy, bank size and government expenditure increase bank liquidity of the commercial bank but deposit decreases it.

Poudel (2021) investigated the determinants of liquidity in commercial banks of Nepal and examine the relationship between bank's specific variables and macro-economic variables on liquidity of commercial banks of Nepal. The study covers the period from 2009/10 to 2019/20 and nine commercial banks were taken in consideration for study purpose. Different financial, descriptive and statistical tools namely, average, standard deviation, correlation coefficient, coefficient of variation, correlation coefficient, ANOVA and

regression analysis were used in the study. The findings of the study show that Capital adequacy ratio, share of non-performing loan and GDP have significant impact on determining the liquidity of Nepalese commercial bank but bank size and inflation rate has insignificant impact. The study reveals that selected independent variables capital adequacy ratio and bank size have positive relation with liquidity level but deposit and GDP have negative relation. The study also concludes that capital adequacy ratio and share of nonperforming loan have positive impact on liquidity.

The common theme from some of the empirical studies above reflected the different results reached on the factors affecting bank liquidity. The most studies used a regression model to analyze data to determine the relationship. The present study has been conducted and the hypothesis has been set and tested on the basis of above-mentioned studies. Nevertheless, according to the best of our knowledge, there are very few studies that examines these determinants with liquidity in the Nepalese context. This remarks the significance of the present paper as this study put an attempt to analyze bank specific and macroeconomic determinants with bank liquidity in the Nepali context has not been widely conducted before.

2.2 Research Gap and Additional Contribution

Although, there are many researchers that have been conducted examining the micro and macro determinants of factors affecting commercial bank liquidity in other countries and few studies carried out in Nepal, the current study includes major macroeconomic factors government expenditure, public debt, inflation, money supply and remittance which have not been considered in the past studies. Remittance is a major source of foreign currency which affects Net Foreign Assets of country affecting the overall market liquidity. Similarly, historically, due to high budget deficit, foreign loan and grant played significant contribution on Government expenditure in Nepal. This also increases the overall liquidity of market. When government collects public debt from market it competes for the resources with other private players for liquidity affecting liquidity in the market. All these factors directly affect liquidity of commercial banks. Therefore, the inclusion of macroeconomic factors of government expenditure, remittance and public debt will decrease gap between the current studies and this study.

This study attempts to address the gap empirically through assessing the bank specific and macro-economic factors influencing the liquidity of commercial banks of Nepal therefore, constructing a notable addition to the existing literature body as well as showing strong value of originality.

CHAPTER - III

RESEARCH METHODOLOGY

The research methodology followed for this study is presented in this chapter, which aims at answering the research question, presents theoretical framework, conceptual frameworks, overall plan for the collection, analysis and presentation of data and specification of model used to analyze the variables.

3.1 Conceptual Framework

Conceptual framework is developed from the review of literature discussed above. It shows the relationship between dependent variable such as liquidity and independent variables such as bank specific and macroeconomic. Bank specific variable consists of bank deposit, bank credit, bank capital and bank assets whereas, a macroeconomic variable consists of money supply, government expenditure, remittance and public debt.

3.1.1   Bank Deposit and Liquidity

Bank deposits are money placed into a deposit account at a banking institution, such as current, saving, call, fixed and money market account. The coefficient value of deposit ratio has a statistically positive effect on liquidity (AI- Homaidi et al.,2019). Bank have a positive impact on liquidity. Banks are dependent on deposit and external funds for their liquidity needs (Singh & Sharma, 2016) while Shah et al., (2018) found negative effect of deposit on liquidity.

3.1.2   Bank Credit and Liquidity

Banks and financial institutions make money from the funds they lend out to their client. Bank credit consist of the total amount of combined funds that financial institutions advance to individuals or business. Different studies have shown relationship of credit with liquidity. Loan growth had a negative and statistically insignificant impact on banks liquidity (Subedi & Neupane, 2013). Loan outstanding to asset ratio is positively related to the liquidity risk of the bank, bank usually increase the loan and advance disbursement to increase the profitability of bank which dries out the liquidity and enhance liquidity risk

(Ahamed, 2021). For the study purpose all types of credit provided by banks has been used as a variable.

3.1.3 Bank Capital and Liquidity

Paid up capital is the money provided by the shareholders into the company since the establishment. It includes the initial fund accumulated from the shareholders plus additional capital injected through right/bonus share or FPO as the company moves forward. Capital is one of the bank specific factors that influence the level of bank's liquidity. Capital act as a buffer in case of adverse situation. Bank's capital creates liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs. Moreover, greater bank capital reduces the chance of distress. Capital adequacy is directly proportional to the resilience of the bank to crisis situations. Therefore, capital adequacy is expected to be positively correlated to liquidity. Capital may also reduce liquidity creation because it crowds out deposits. NRB has defined the components included in the capital fund. Capital fund of the bank include total capital, statutory reserves, retained earnings and other reserve. Vodova (2011) and AI-Homaidi et al., (2019) has found positive effect of capital adequacy on liquidity. Lotto and Mwemezi (2015) and Subedi & Neupane (2013) found negative effect of capital adequacy on liquidity. The proxy for capital adequacy used in this study paid up capital of commercial banks.

3.1.4 Bank Assets and Liquidity

Bank can have different types of assets, including physical assets, such as equipment and land; loans, including interest from consumer and business loans; reserves or holding deposits of the central bank and vault cash and investments or securities. Various studies have shown relationship of bank size and liquidity of banks. Even though higher asset liquidity directly benefits stability by encouraging banks to reduce the risks on their balance sheets and by facilitating the liquidation of asset in a crisis, it also makes crises less costly for banks. As a result, banks have an incentive to take on an amount of new risk that more than offsets the positive direct impact on stability (Wagner, 2006). Lotto and Mwenezi (2015) finds negative relation between bank size and liquidity while AI-Homaidi et. al., (2019) finds positive relationship. While it is mandatory for banks to maintain liquidity as per its size the actual amount may vary according to the internal requirement of banks. It

is general assumptions that higher the bank size higher is the liquidity required. Bank size had positive and significant impact on banks liquidity (Subedi and Neupane, 2013). For the study purpose banks assets has been taken as proxy for bank size.

3.1.5 Money Supply and Liquidity

Money supply is all the currency and other liquid instruments in a country's economy on the date measured. In order to capture the macroeconomic effect associated with GDP, money supply is considered in the study. Money supply refers to the supply of money and the term liquidity relates to the interplay between the supply of and the demand for money. Liquidity is the outcome of the interplay between the supply and demand for money. An increase in money supply can have two effects; one it can reduce the real interest rate and it forecasts higher future inflation. Arif, Chung and Mohamad (2013) find positive relationship of money supply in liquidity. Broad money supply (M2) has been taken for the purpose of the study.

3.1.6 Government Expenditure and Liquidity

Government expenditure refers to the purchase of goods and services, which include public consumption and public investment and transfer payments consisting of income transfers (pensions, social benefits) and capital transfer. It is generally observed that when government makes large scale expenditure the money goes to the banking channel and liquidity of the commercial bank increases. During the last couple of years Nepal is also witnessing liquidity crunch. One of the reasons, as scholars point out is because government is not able to spend on Capital expenditure. Effect of government expenditure on the both of the employment and liquidity is positive. As such, increased government expenditure is likely to have positive impact in liquidity Faramarzi et al., (2014). Total quarterly government expenditure has been used in this study and this includes all the recurrent expenditure, capital expenditure, financial expenditure and other (freeze account) expenditure.

3.1.7 Remittance and Liquidity

Remittance are inflows of the foreign exchange into host country from workers overseas. When remittance comes through banking channel, the central bank purchase most of the foreign currency. When central bank purchases foreign currency, it injects liquidity in the

market which ultimately ends up in commercial banks as a deposit. Remittance is statistically significant factor affecting liquidity, it has positive influence on bank liquidity (Bista and Basnet, 2020). For the study purpose remittance received has been used.

3.1.8 Public Debt and Liquidity

Pubic debt is the total amount, including total liabilities, borrowed by the government to meet its development budget. Public debts and borrowing have national macroeconomic implications, and also used as one of the tools available to the national government in the macroeconomic management of the national economy, enabling the government to create or dampen liquidity in financial markets, with flow effects on the wider economy. Public debt covers only the internal borrowing by the government. It is the sum of debts collected from general public. BFIs and central bank. The net government debt is gross government debt less its financial assets, which is often expressed as a percentage of gross domestic product (GDP). Higher debt by the government means that the liquid fund will be directed towards government's account bringing liquidity problem in BFIs so it is expected to have negative relationship between public debt and liquidity. However, Teixeira et al., (2021) find that government debt securities have no significant effect on changes in bank liquidity risks. Total volume of domestic borrowing by government has been used for the study.

Following figure shows the dependent and independent variables of the study.

Figure 1: Framework to study the relationship between variables

24
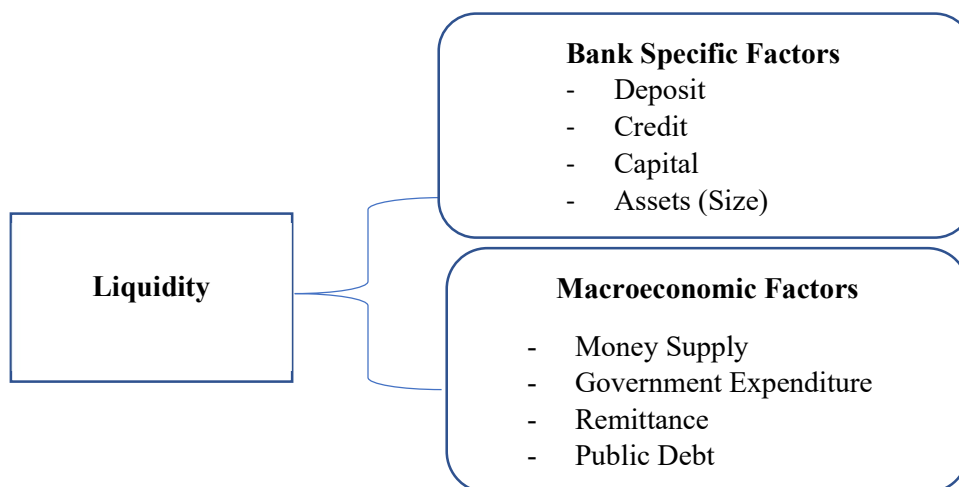
3.2 Research Design

Research design namely causal comparative has been used for the purpose of the study to analyze the cause-and-effect relationship between the explanatory variables and bank liquidity. Causal comparative approach has been adopted to establish the directions, magnitudes and forms of the observed relationship between liquidity and other independent variables. For the purpose of the study regression analysis has been conducted.

3.3 Nature and Source of Data

The study is fully base on secondary data. With regards to the data sources, time series data of bank specific variables and macroeconomic variables have been taken from the Quarterly Economic Bulletin published by the central bank of Nepal, Nepal Rastra Bank from its websites.

3.4 Study Period Covered

The study uses quarterly data on different variables for 15 years from the fiscal year 2006 to 2020/21.

3.5 Sampling Size and Sampling Procedure

The sample size of the current study consists of all commercial bank in Nepal excluding other banks and financial institution such as Development Bank, Finance and Micro Finance. The banking data includes aggregate data of all existing commercial banks currently operated in Nepal over the period of 2006 October to 2021 July spanning for 15 years, and quarterly data has been collected for in-depth insight on the factors affecting bank liquidity. Time series data has been used for the study purpose.

3.6 Specification of Model

The study apply an Autoregressive Distributed Lag (ARDL) model for the empirical measurement of the relationship between the Commercial Bank Liquidity and each of the other explanatory variables that have been identified through literature and theory i.e., expenditure, inflation, money supply, and remittance, other factors not explicitly included in the model are policy instruments for regulation of banks operation like government policy, monetary authorities, guidelines and past relationship with customers. These are captured by the error term in the model (Timsina, 2017).

Taking difference of non-stationary time series and using OLS method after making all the variables stationary may seem to be an easy way to analyze the relationship. However, the difference represents only the short-run change in the time series but totally misses out the long-run information. Hence this method is not suggested for the analysis of non-stationary variables. An autoregressive distributed lag (ARDL) model is an ordinary least square (OLS) based model which is applicable for both non-stationary time series as well as for time series with mixed order of integration. This model takes sufficient numbers of lags to capture the data generating process in a general to specific modeling framework. A dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation. Likewise, the ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information and avoids problems such as spurious relationship resulting from non-stationary time series data. (Shrestha and Bhatta, 2018).

ARDL is an ordinary least square (OLS) based model which is applicable for both non-stationary time series as well as for time series with mixed order of integration. The model is specified implicitly below:

$$LIQ = f(\ DEP, CRD, CA, SIZE, GOVEX, DB, RMT, M2)$$

The mathematical form of the function above is represented as follows:

$$LIQ_t = \alpha_t + \beta_1 DEP_t + \beta_2 CRDt + \beta_3 CA_t + \beta_4 SIZE_t + \beta_5 M2_t + \beta_6 GOVEX_t + \beta_7 RMT_t + \beta_8 DB_t + \varepsilon_t$$

Where,

LIQ_t = Commercial banks Liquidity on year t.

Dep_t = Volume of Deposit in year t.

CRD_t = Volume of Credit in year t.

CA_t = Volume of Paid up in year t.

$SIZE_t$ = Volume of Bank Assets in year t.

$M2_t$ = Volume of Money supply (M2) in year t.

$GOVEX_t$ = Government Expenditure of Nepal in year t.

Rem_t = Remittance inflow of Nepal in Year t.

DB_t = Domestic Borrowing of Nepal in year t.

β = Coefficient of Variables

α = Constant

$\mathcal{E}_t$ = is random error term

To assess the short-run and long-run relationship between the independent variable and the liquidity, the Autoregressive Distributed Lags (ARDL) method is utilized. The ARDL method has been extensively utilized as it provides several advantages over traditional statistical methods for assessment of integration and short/long-run relationships. Firstly, in contrast to traditional methods such as Johansen's tests, Granger/Engle casualty test and Vector Auto regression (VAR), ARDL can be utilized to test for a level relationship for variables (Haq and Larrson, 2016). However, ARDL does not work with non-stationary variables integrated of order two I (1). The possibility to combine I (0) and I(1) variables is great advantage as financial time series often are either I (1) or I (0) (Shrestha & Bhatta, 2018). The advantage can be further clarified by comparing e.g. VAR with if the data is non-stationary I (1) one would have to take the first difference of the series and then utilized VAR. However, if one takes the first difference of the data, long-run relation between series may disappear (Brooks, 2014). In contrast, in an ARDL framework it is not necessary to make an adjustment to the data and hence long-run relationship still remain possible to calculate. (Larrson and Haq, 2016).

Following the ARDL approach proposed by Pesaran and Shin (1998), the existence of a long-run relationship could be tested using following equation:

$\Delta Linliq = \alpha + \sum_{i=0}^{m} aj\Delta lnliqt-1 + \sum_{i=0}^{n} bj\Delta lnastt-j + \sum_{i=0}^{o} cj\Delta lncat-j + \sum_{i=0}^{p} dj\Delta lncrdt-j + \sum_{i=0}^{q}$

$ej\Delta lndept-j + \sum_{i=0}^{r} fj\Delta lngovext-j + \sum_{i=0}^{s} gj\Delta lnm2t-j + \sum_{i=0}^{t} hj\Delta lndbt-j + \sum_{i=0}^{u} ij\Delta lnrmtt-j + \Upsilon_1 liq_{t-}$

$_1 + \Upsilon_2 ast_{t-1} + \Upsilon_3 ca_{t-1} + \Upsilon_4 crd_{t-1} + \Upsilon_5 dep_{t-1} + \Upsilon_6 govex_{t-1} + \Upsilon_7 m2_{t-1} + \Upsilon_8 db_{t-1} + \Upsilon_9 rmt_{t-1} +$

$\mathcal{E}$..................(1)

Here, all variables are as previously defined, $\Upsilon_1, \Upsilon_2, \Upsilon_3, \Upsilon_4, \Upsilon_5, \Upsilon_6, \Upsilon_7, \Upsilon_8, \Upsilon_9$ are the long rung coefficients while a_j, b_j, $_{Cj}$, d_j, e_j, f_j, g_j, h_j, i_j, represents the short run dynamics and $\mathcal{E}$ represents a random disturbance term.

$$\Delta Linliq = \alpha + \sum_{i=0}^{m} aj\Delta lnliqt\text{-}1 + \sum_{i=0}^{n} bj\Delta lnastt\text{-}j + \sum_{i=0}^{o} cj\Delta lncat\text{-}j + \sum_{i=0}^{p} dj\Delta lncrdt\text{-}j + \sum_{i=0}^{q}$$

$$ej\Delta lndept\text{-}j + \sum_{i=0}^{r} fj\Delta lngovext\text{-}j + \sum_{i=0}^{s} gj\Delta lnm2t\text{-}j + \sum_{i=0}^{t} hj\Delta lndbt\text{-}j + \sum_{i=0}^{u} ij\Delta lnrmtt\text{-}j + ECM_{t\text{-}}$$

$_1$ .... (2)

The coefficients a_j, b_j $,C_j$,d_j, e_j, f_j, g_j, h_j, i_j, , are the short run dynamics of the model and φ indicate the divergence or convergence towards a long run equilibrium. A positive coefficient indicates a divergence, while a negative coefficient indicates a convergence (Byanjankar, 2020). The ECM coefficient must be statistically significant and negative in coefficient confirms the existence of a stable long-run relationship and cointegration between the independent and dependent variables. The coefficient also determines the speed of adjustment towards equilibrium (Larsson and Haq, 2016).

3.6.1 Unit Root Test

The determination and verification of the order of integration is a quite wide area that includes an extensive list of tests known as unit root test, where the most commonly used are Dickey and Fuller's DF-test and ADF test (Dickey and Fuller, 1979), Philips- Perron, 1988), KPSS test (Kwiatkoski, Phillips, Schmidt and Shin, 1992), also less frequently used ADF-GLS test (Elliot, Rothenberg and Stock, 1996) and NGP test (Ng and Perron 1955 and 2001). Unit root testing in time series is one of the fundamental steps in the construction of univariate and multivariate econometric models. Dickey Fuller test is one of the best known and most widely used unit root tests and it is based on the model of the first order autoregressive process. Philips -Perron Test deals with a problem of selection of lag p in the regression model. KPSS test is built on the idea that the time series is stationary around a deterministic trend and is calculated as the sum of a deterministic trend, random walk and stationary random error (Fedorova, 2016).

The statistical procedure employed to determine the stationarity of a series is called 'unit root test' (Shrestha and Bhatta, 2018). As most macroeconomic time series are not stationary at levels seeking a methodology for modeling any economic relationship is to ascertain the stationary nature of the variables under scrutiny, otherwise regression results would be spurious (Timsina, 2017). In this case, the ARDL technique did not require to

pre-tested but it was necessary to investigate the univariate characteristics of the series using Augmented Dickey-Fuller (ADF) and Phillip Perrron (P-P) tests.

3.6.2 Bound Test

To test whether the long-run equilibrium relationship exist between the Variables, bound test (F-version) for cointegration is carried out. (Byanjankar, 2020). When $Y_1 = Y_2 = Y_3 = Y_4 = Y_5 = Y_6 = Y_8 = Y_9 = 0$ no cointegration exist hence no long run relationship is established between the variables. While $Y_1 \neq Y_2 \neq Y_3 \neq Y_4 \neq Y_5 \neq Y_6 \neq Y_8 \neq Y_9 \neq 0$ shows there is cointegration between variable hence long run relationship. The F-statistics is then compared with the critical values provided by upper bound of the critical value, the null hypothesis of no cointegration is rejected, if it lies within the lower and upper bounds, the result is inconclusive, and if it lies below the lower bound, the null hypothesis cannot be rejected (Byanjankar,2020)

3.6.3 Diagnostic Test

The ARDL model tries to find the best linear unbiased estimator (BLUE) and thereby diagnostic tests need to be conducted. We will validate the results and ensure that the results are statistically robust by utilizing tests for stability, serial correlation, heteroscedasticity, misspecification (RESET) and normality in the residuals. If the model contains none of the below biases and the model provides satisfactory results (Larrson and Haq, 2016).

3.6.3.1 Test for Serial Correlation

Breusch-Godfrey test (Godfrey 1978) for serial correlation if different lags of the residuals are correlated. Serial correlation does not affect the unbiasedness of the regression estimators but rather affect the efficiency i.e. The estimators are not BLUE. It may for example affect the standard errors of the regression which invalidate significance tests i.e. there is a possibility that wrong inferences could be made whether the independent variables are determinants of the variations in the dependent variable. The test has the following general null hypothesis (Larrson and Haq, 2016)

H0: $p = 0$, No serial correlation in the model

H1: $p \neq 0$, there is serial correlation in the model

3.6.3.2 Test for Heteroscedasticity

For the ARDL model it is assumed that the residuals have a constant variance (homoscedasticity). If the model does not have a constant variance (heteroscedasticity) in the residuals the estimated coefficient will no longer be BLUE and will not have the minimum variance of the unbiased estimators. In relation to serial correlation the consequences could be that one makes wrong inferences. In this thesis we use Breusch-Pagan-Godfery Test for heteroscedasticity. The test has the following general null hypothesis and alternative hypothesis (Larrson and Haq, 2016)

H_0: Constant Variance of the Residuals= Homoscedasticity

H_1: Non constant Variance of the Residuals = Heteroscedasticity

3.6.3.3 Regression Specification Error Test

Ramsey Regression Specification Error Test (RESET) (Ramsey 1969) for functional form i.e. it test if non-linear combinations of the fitted values can describe the explanatory variable. If non-linear combinations of the fitted values have power in describing the explanatory variable the model is said to be miss specified and needs adjustments. The non-mathematical null and alternatives hypothesis is as follows (Larrson and Haq, 2016).

H_0: No power in non-linear combination = No miss specification

H_1: The non-linear combinations have power = Miss specification

3.6.3.4 Test for Normality of the Residuals

We use Jarque-Bera Test of Normality in the residuals. Normality is necessary in order to conduct hypothesis tests of model parameters. Thus, non-normality may cause problems regarding statistical inference of the coefficient estimates such as significance tests and for confidence intervals that relies on the normality assumption. The very geeral null and alternative hypothesis are as follows (Larrson and Haq, 2016)

H_0: There is normality in the residuals

H_1: There is non-normality in the residuals

3.6.3.5 Test for Stability

The CUSUM and CUSUMSQ tests proposed by Brown, Durbin and Evans (1975) have been applied to test the stability of the model. The CUSUM test makes use of the cumulative sum of recursive residuals based on the first set of n observations and is updated recursively and plotted against breakpoints. If the plot of CUSUM statistics lies within the critical bounds of a 5 percent level of significance level represented by a pair of straight lines drawn at the 5 percent level significance, the null hypothesis that all coefficient in the error correction model is stable cannot be rejected. If either of the lines is crossed, the null hypothesis of coefficient constancy can be rejected at the 55 level of significance. The CUSUMSQ test, which is based on the squared recursive residuals, is carried out with a similar procedure.

3.7 Research Hypothesis

To understand the factors determining banks liquidity, this study will test hypothesis based on similar studies carried out. The relationship will be measured on the basis of the effect of the independent on dependent variables. Hypothesis are presented below;

H_0: $Y_1 = Y_2 = Y_3 = Y_4 = Y_5 = Y_6 = Y_8 = Y_9 = 0$ There is no long run relationship.

H_1: $Y_1 \neq Y_2 \neq Y_3 \neq Y_4 \neq Y_5 \neq Y_6 \neq Y_8 \neq Y_9 \neq 0$. There is long run relationship.

3.8 Analysis Tools

Trend Analysis is carried to visualize the trend and stationarity of variables. To test the proposed hypothesis, statistical analysis has been carried out using the following methods: First, descriptive statistics & correlation analysis of the variables (both dependent and independent) were calculated over the sample period to visualize the direction of the relationship between the variables. Unit Root test is also carried out to determine the stationarity of a series. Finally, ARDL (ordinary least square) approach including all of its assumptions was employed. The assumptions were tested to see the applicability of the regression models developed first to test the relationship between banks liquidity and independent variables. Data collected from different sources were analyzed by using software E views 10 package and Microsoft Excel which revealed the relationship between independent and dependent variables.

CHAPTER - IV

DATA ANALYSIS AND PRESENTATION

This chapter deals with data presentation, analysis and interpretation based on the research methodology explained in the previous chapter. The prime aim of the chapter is to analyze and elucidate the collected data following the conversion of unprocessed data to an understandable presentation. This chapter presents the result and discussion of estimations of the model specified.

4.1 Trend Analysis

4.1.1 Trend Analysis of Bank Liquidity

Figure 2 presents quarterly trend analysis of bank liquidity from 2006 October to 2021 July. This bank liquidity is ratio with total assets of the commercial bank. X-axis represent time period from 2006 October to 2021 July whereas Y-axis represent to percentage of bank liquidity. Over 15 years, there is variation of the bank liquidity of the commercial bank.

Figure 2: Trend Analysis of the Bank Liquidity
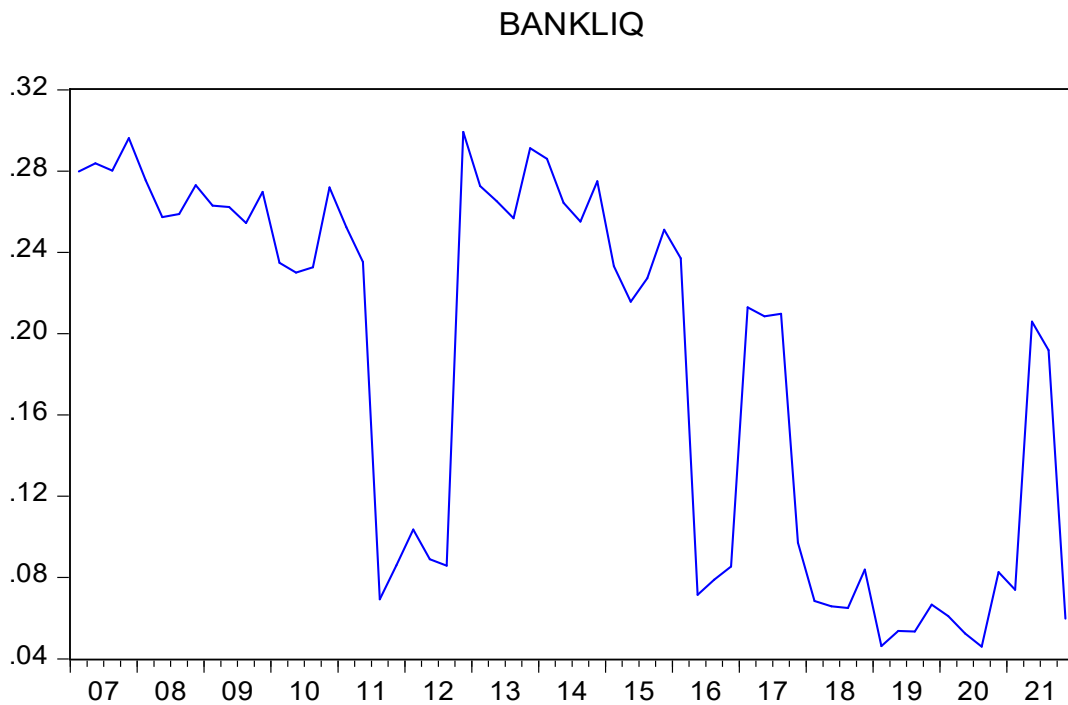
BANKLIQ

Source: Author's Calculation using EViews

In above figure X- axis represents time period from October 2006 to July 2021 and Y-axis represent the percentage of bank liquidity as compared to total assets. Bank liquidity of commercial bank includes liquid assets to total assets. Trend line of bank liquidity of the commercial bank over 15 years from 2007 to 2021 is fluctuating, instable and decreasing. Over 15 years, mean of bank liquidity for the commercial bank is 18.36%. In 2011, 2012 2016, 2018, 2019 and 2020 bank liquidity were below mean. Over the 15 years, there is variation of the bank liquidity of the commercial bank. Such variation can be because of bank specific variable and macroeconomic variables. It indicates the risk of bank liquidity in the commercial bank.

Liquidity shows some fluctuations in the year 2011, 2012, 2016, 2018, 2019 and 2020. In 2010 reserves have declined as exports fell, remittances softened, and imports soared, resulting in a liquidity crunch. Similarly, in 2016 when central bank increases paid up capital of Bank and Financial Institutions to four-fold, liquidity in commercial bank declined sharply. According to the Economic Survey, 2020-21, the Gross National Savings of 31.4% of GDP in FY 2020-21, while it was 42.1% of GDP in 2019-20. Therefore, due to deteriorating national savings, bank's deposit was not able to keep pace with the demand for credit causing liquidity shortage.

4.1.2 Trend Analysis of Liquidity with different Independent Variables

Figure 3 to 10, presents the visual representation of trend analysis of dependent with independent variables.

Figure 3: Trend Analysis of Banks Liquid Assets and Banks Deposits

Source: Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amount of bank deposit and liquid asset. We can see the increasing trend of banks deposit whereas instability can be observed in banks liquid assets and it is also not following the same trend as of banks deposit though there is positive correlation coefficient of 0.6369 with banks deposit.

Figure 4: Trend Analysis of Banks Liquid Assets and Banks Credits

Source: Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amount of banks credit and liquid asset. We can see the increasing trend of banks credit whereas instability can be observed in banks liquid assets and it is also not following the same trend as of banks credit though there is positive correlation coefficient of 0.6081 with banks credit.

Figure 5: Trend Analysis of Bank Liquid Assets and Banks Capitals

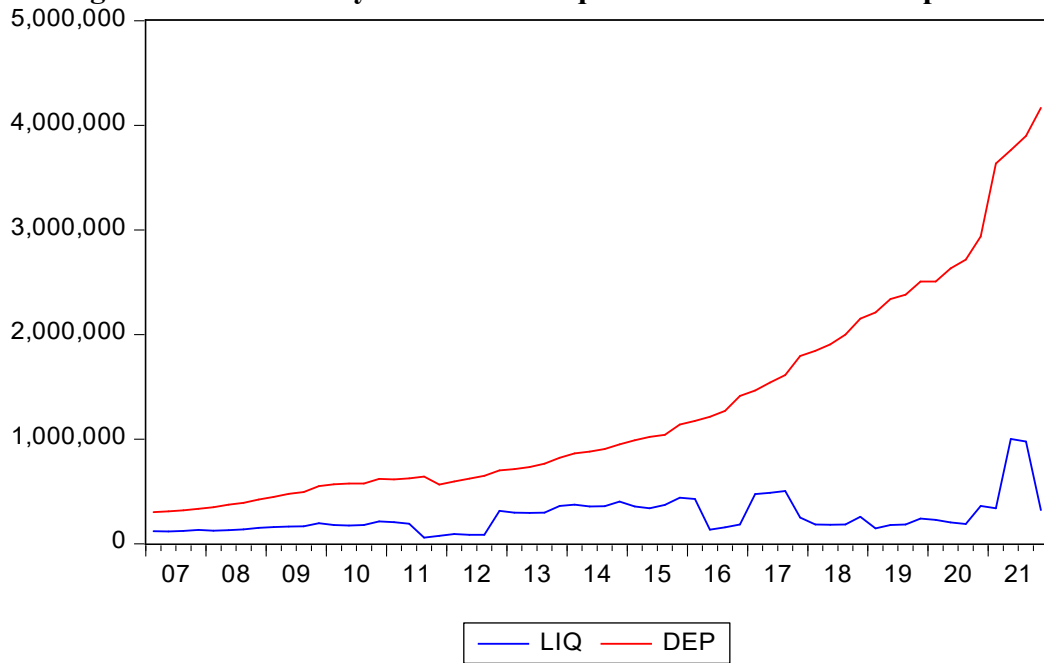In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amount of banks liquid assets and banks capital. We can see the slightly increasing trend of banks capital whereas instability can be observed in bank liquid assets and it is also not following the same trend as of banks capital though there is positive correlation coefficient of 0.5761 with banks capital.

Figure 6: Trend Analysis of Bank Liquid Assets and Banks Assets

Source: Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amounts of banks assets and banks liquid assets. We can see the increasing trend of banks assets whereas instability can be observed in bank liquid assets and it is also not following the same trend as of banks capital though there is positive correlation coefficient of 0.6192 with banks assets. Credit and deposit of commercial banks shows increasing trend. Since, asset is positively correlated with deposit and credit any subsequent change in credit or deposit changes assets as in the same directions well. Therefore, assets of commercial banks also show increasing trend.

Figure 7: Trend Analysis of Bank Liquid Assets and Money Supply

*Source***:** Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amounts of money supply and banks liquid assets. We can see the slight increasing trend of money supply with some fluctuation in 2016 whereas instability can be observed in bank liquid assets and it is also not following the same trend as of banks capital though there is positive correlation coefficient of 0.6134 with money supply.
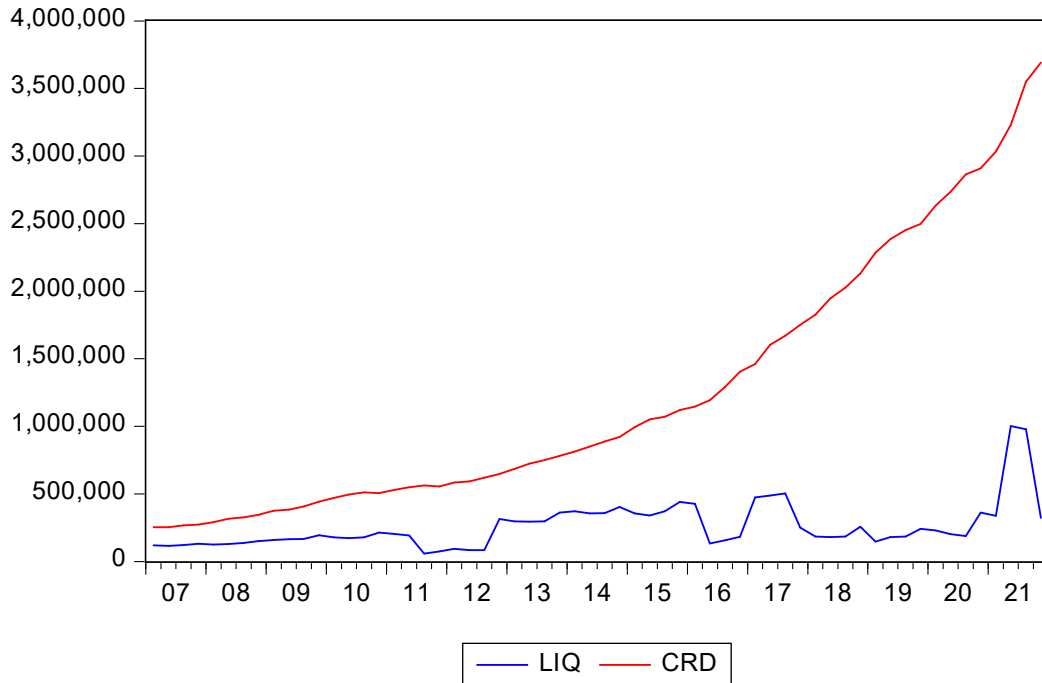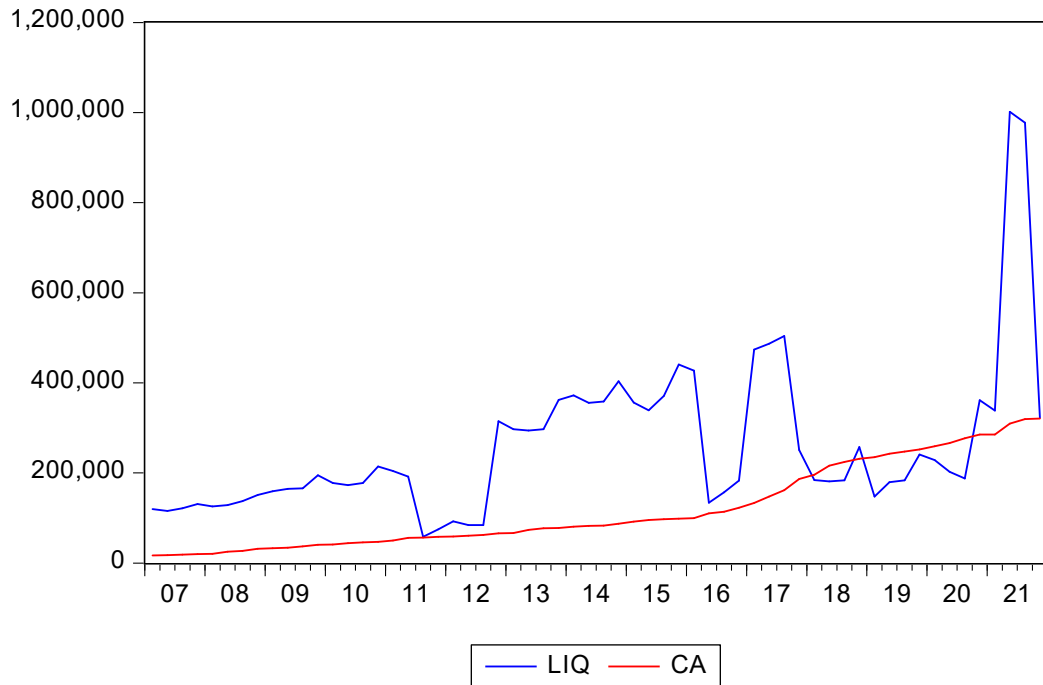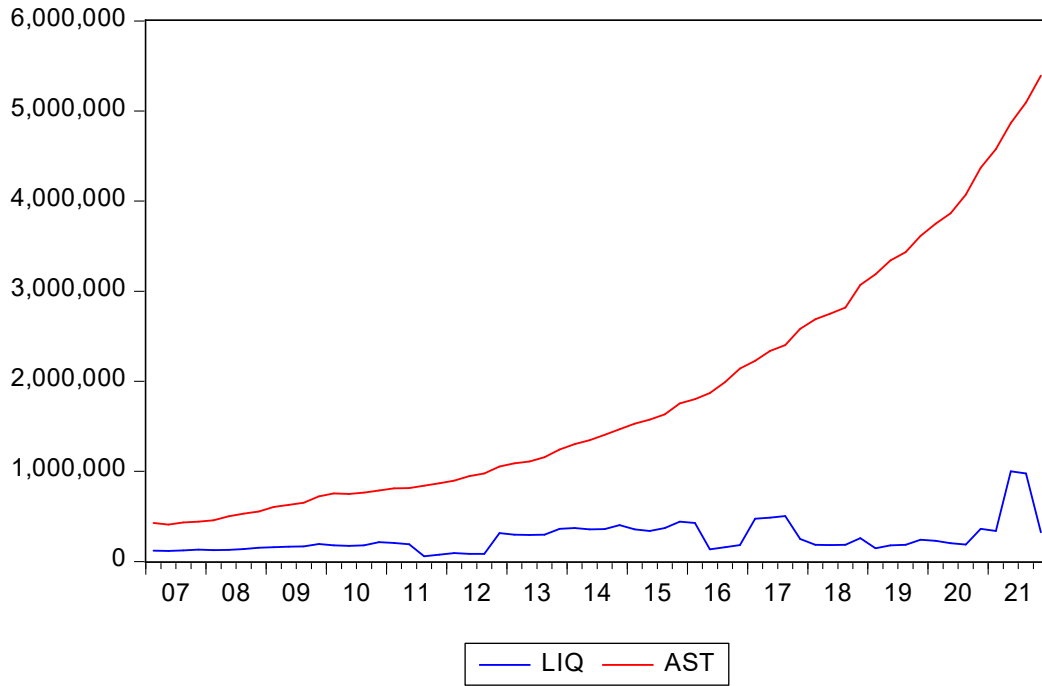
Figure 8: Trend Analysis of Bank Liquid Assets and Government Expenditure

Source: Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amounts of banks liquid assets and government expenditure. We can see instability in trends in both the banks liquid assets and government expenditure. Due to the trend of incurring expenditure on last of each fiscal year we can see peak on above figure for each fiscal year as result of increase in expenditure in the last fourth quarter of fiscal year. Bank liquid assets is not following the same trend as of government expenditure though there is positive correlation coefficient of 0.3616 with government expenditure. Government expenditure shows increasing trend. In Nepal, large amount of government budget is spent in the last quarter of the fiscal year and especially in the last month of the fiscal year. Therefore, in the month of July government expenditure increased very rapidly which is visible in the figure. In fiscal year 2021-22, the government planned to spend NPR 1.47 trillion but according to the NRB statistics, total government expenditure amounted to NPR 1.18 trillion only this showing the inability of the government to spend as planned. So, the government's inability to mobilize funds in the economy has contributed to a prolonged liquidity crisis in Nepal.

Figure 9: Trend Analysis of Bank Liquid Assets and Remittances
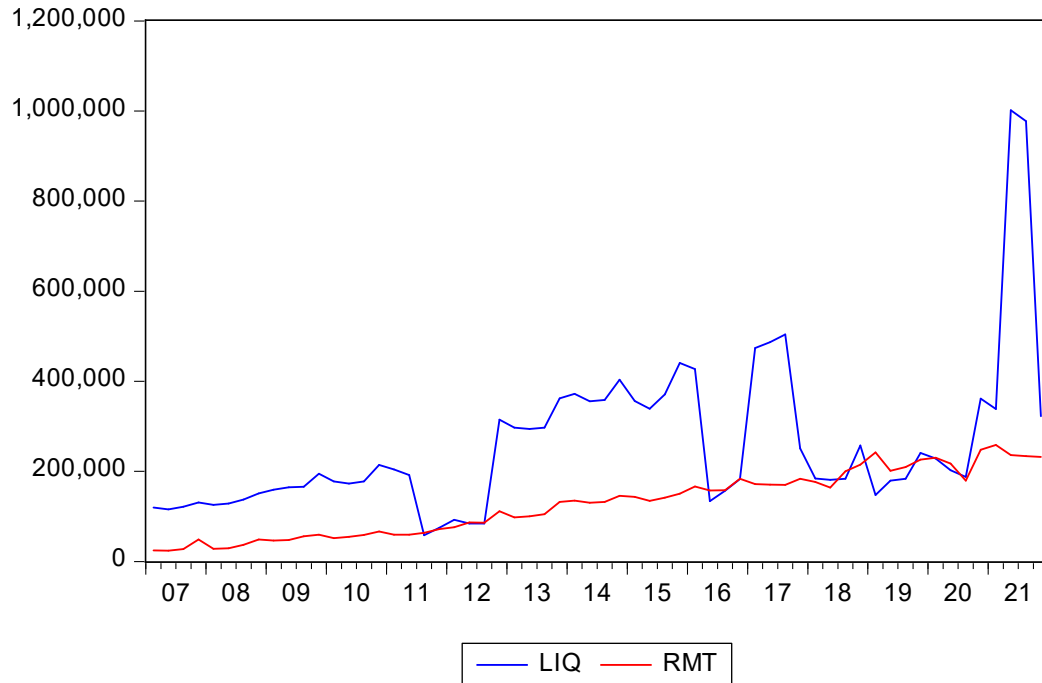
*Source***:** Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amounts of banks liquid assets and remittance. From the above figure we can see that remittance has more stability with increasing trend in comparison to the liquid assets whereas we can see many up downs in case of liquid assets. Bank liquid assets is not following the same trend as of remittance though there is positive correlation coefficient of 0.5852 with remittance.
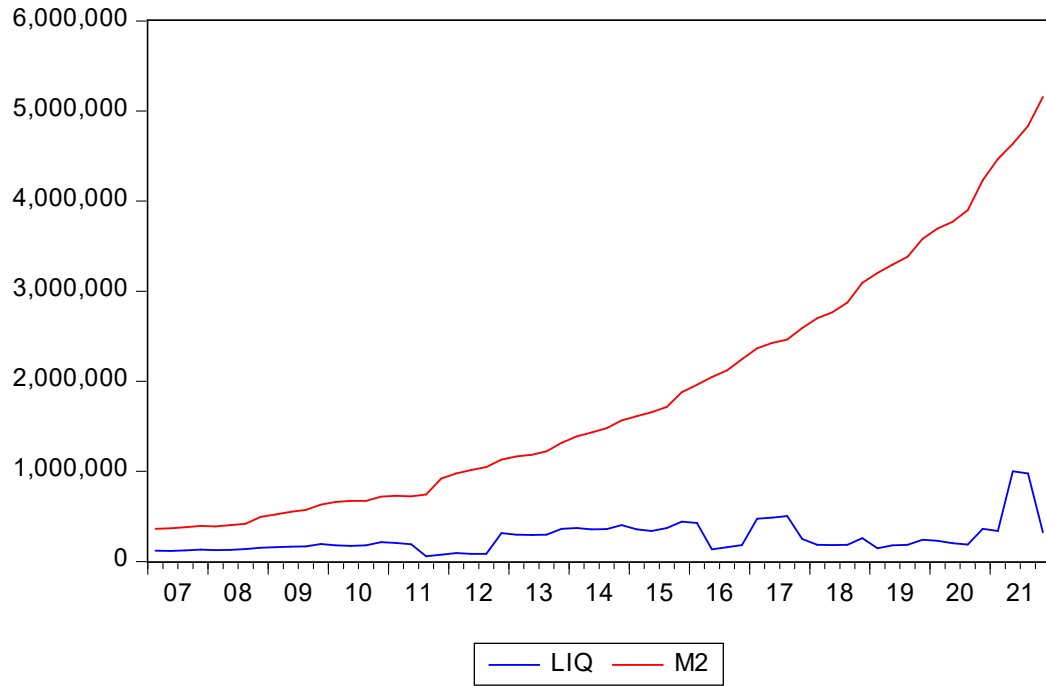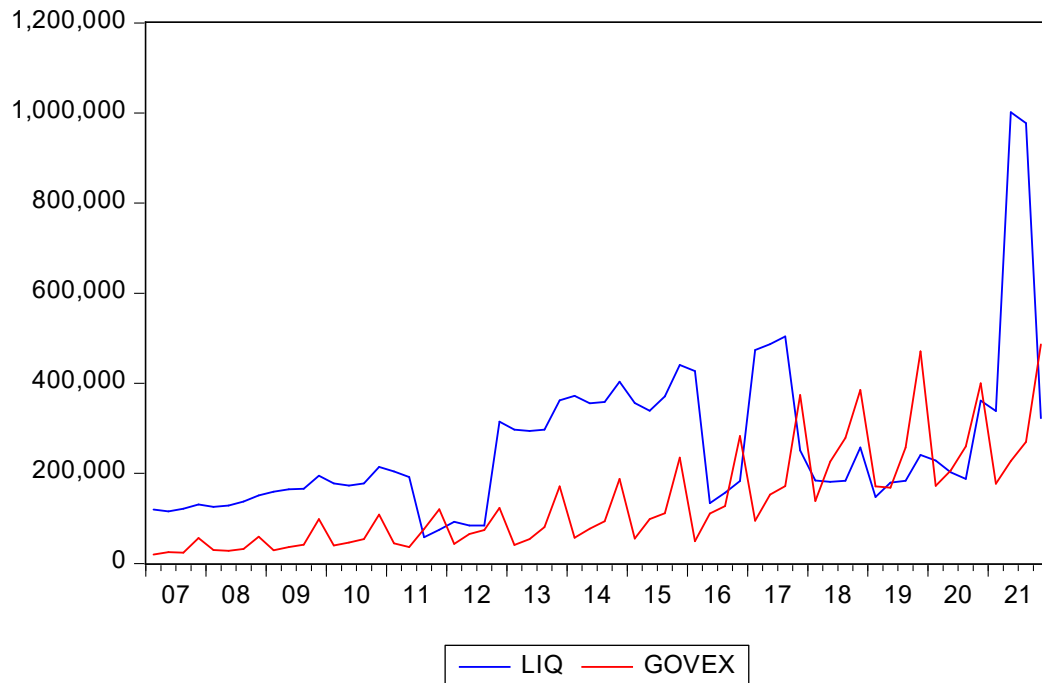
Figure 10: Trend Analysis of Bank Liquid Assets and Public Debts
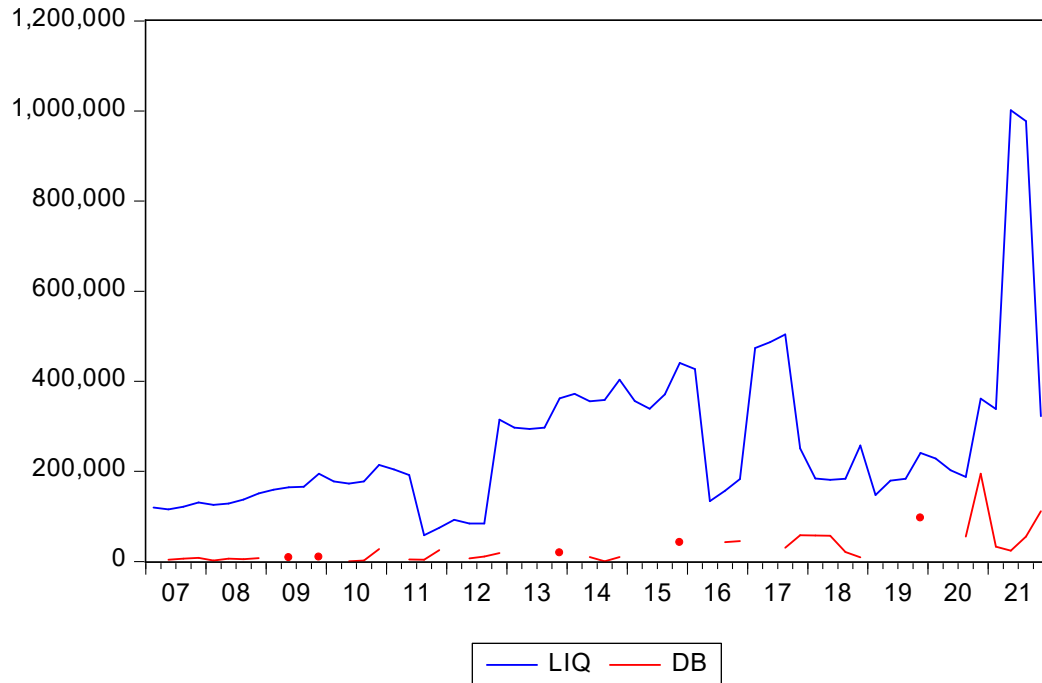
Source: Author's Calculation using EViews

In the above figure, X-axis represents the time period from October 2006 to July 2021 and Y-axis represent the amounts of banks liquid assets and public debt. From the above figure we can see that public debt has more un-stability in comparison to the liquid assets as this can be due to issuance and absence of public debt sometime during some period of time between October 2006 to July 2021. Bank liquid assets is not following the same trend as of public debt though there is least positive correlation coefficient of 0.2255 with public debt. Domestic borrowing shows very fluctuating trend. Since, government borrowing is determined by the governments cash need and revenue collection amount, government resorts to its cash position to determine whether it needs to borrows or not. Since, government does not always borrow, it causes large fluctuation in domestic borrowing.

Dependent variable liquidity is in both trends increasing and decreasing. Except domestic borrowing all the variables show non-stationarity as they follow particular trend. However, caution should be taken while deciding about the stationarity of the variables. As most macroeconomic time series are not stationary at levels, appropriate statistical tools should be used to decide on the stationarity. The starting point is to examine the properties of

41

series graphically and confirming it statistically. Graphs are the most preliminary tool to get the rough idea about the stationarity of the series. However, statistical tests are required for final decision (Shrestha and Bhatta, 2018).

4.2 Determinants of Liquidity in Commercial Banks in Nepal

4.2.1 Descriptive Statistics

The results of descriptive statistics contain dependent and independent variable and each of which contains 1620 observation from 27 banks throughout 2006 Oct to 2021 July. In table 1 the descriptive statistics for the dependent and independent variables are presented. The dependent variable is liquidity. The remaining are independent variables: assets, capital, adequacy, credit, deposit, domestic borrowing, government expenditure, inflation, money supply and remittance.

Table 1: Descriptive Statistics

Variables	LIQ	DEP	CRD	CA	AST	M2	GOVEX	RMT	DB
Mean	260352	1352699	1271421	122729	1897822	1868718	161447	125355	29714
St. Dev.	205361	1128353	1047829	101520	1511847	1473378	130765	74566	38127
Minimum	58313	310032	253424	17538	408035	367717	23912	24119	50
Maximum	1001819	4167463	3690886	320629	5392527	5154853	486187	258858	194642
Count	60	60	60	60	60	60	60	60	60

Source: Author's Calculation using EViews

The table shows that the minimum value of dependent variable liquidity (LIQ) has Rs 58,313 million whereas the maximum value is around Rs 1,001,819 million with a mean of Rs 260,352 million. The standard deviation for liquidity is nearly 205,361 which indicates the spread from the mean. The independent variable deposit (DEP) has moderate variability a maximum value of Rs 4,167,463 million and a minimum value of Rs 310,032 million with a mean of Rs 1,352,699 million and Rs 1,128,353 million disparity. Remittance (RMT) has a low variability with least value of Rs 241119 million and highest value of Rs 258,858 million and a standard deviation of Rs 74,566 million. Table shows the standard deviation of domestic borrowing is large as compared to other variables, because of large fluctuation in government borrowing.

4.2.2 Correlation Analysis

The correlation matrix examines whether two independent variables are highly correlated or not. It cannot be accepted if two independent variables have high collinearity (Sing & Sharma, 2016). A multi collinearity problem occurs if the two independent variables are highly correlated with each other because statistically, it undermines the significance of an independent variable (Mansfield & Helms, 1982). It creates difficulties to declare a particular variable significant although it has a strong relationship with other variables. Such variables are recommended to be exempt to become free from high correlation coefficients (AL-QUADH. 2020).

Table 2: Correlation Analysis

Variables	LIQ	DEP	CRD	CA	AST	M2	GOVEX	RMT	DB
LIQ	1								
DEP	0.636	1							
CRD	0.608	0.992	1						
CA	0.576	0.977	0.992	1					
AST	0.619	0.994	0.998	0.989	1				
M2	0.613	0.988	0.996	0.990	0.997	1			
GOVEX	0.361	0.780	0.816	0.829	0.813	0.826	1		
RMT	0.585	0.905	0.925	0.937	0.931	0.949	0.853	1	
DB	0.225	0.654	0.689	0.684	0.694	0.695	0.758	0.664	1

Source: Author's Calculation using EViews

The correlation coefficient is a number which summarizes the relationship between two variables. The most widely used bi-variant correlation statistics is the Pearson correlation which is used. Table 2 shows that dependent variable liquidity is positively correlated with every variable. Liquidity has high correlation with banks deposit with positive coefficient of 0.636 and has low correlation with domestic borrowing with positive coefficient of 0.225. Liquidity has correlation coefficient of more than 0.225 with other independent variables. Unlike assumption, credit has positive correlation coefficient with liquidity. Correlation among independent variables ranges from as low as 0.225 to as high as 0.998. This study data shows multicollinearity between many independent variables as values of

the correlation coefficient are higher than the cut off level of 80% (Kennedy, 2008). Hence this balanced panel dataset is not free from multicollinearity.

4.2.3 Empirical Results: Unit Root Test, ARDL Estimation and Diagnostic Test

Under this section the empirical findings from the econometric results on the factors affecting bank liquidity were presented. The section covers the empirical regression model used in this study and the results of regression analysis. The empirical test will investigate the short-run and long-run relationship between variables.

4.2.3.1 Unit Root Test

Table no 3, shows the Augmented Dickey Fuller (ADF) and Phillip Perron (P-P) test for all variables under the study.

Table 3: Augmented Dickey Fuller (ADF) and Phillip Perron (P-P) Unit Root Test

	Variable	ADF	P-P
Level			
Intercept	LNLIQ	0.001***	0.018***
	LNDEP	1	1
	LNCRD	1	1
	LNCA	1	1
	LNAST	1	1
	LNM2	0.999	1
	LNGOVEX	0.996	0.001***
	LNRMT	0.975	0.886
	LNDB	NA	0.085
Intercept and Trend	LNLIQ	0.001***	0.021***
	LNDEP	1	1
	LNCRD	1	1
	LNCA	0.987	0.971
	LNAST	1	1
	LNM2	1	1
	LNGOVEX	0.824	0.000***
	LNRMT	0.000***	0.000***
	LNDB	NA	0.008***
First Difference			
Intercept	LNLIQ	0.000***	0.000***
	LNDEP	0.000***	0.000***
	LNCRD	0.989	0.031***
	LNCA	0.067	0.000***
	LNAST	0.999	0.254
	LNM2	0.956	0.019***
	LNGOVEX	0.000***	0.000***

	LNRMT	0.000***	0.000***
	LNDB	NA	0.000***
Intercept and trend	LNLIQ	0.000***	0.000***
	LNDEP	0.000***	0.000***
	LNCRD	0.000***	0.000***
	LNCA	0.000***	0.000***
	LNAST	0.988	0.000***
	LNM2	0.394	0.000***
	LNGOVEX	0.000***	0.000***
	LNRMT	0.000***	0.000***
	LNDB	NA	0.000***

Note: *** Represent the rejection of the null hypothesis at 1% level of Significance,

Source: Author's Calculation using E views

Unit root test presented in the table 3, shows that variables included found to be mix of I (0) and I (1). From table 3, we see the majority of the unit root test (Augmented Dickey-Fuller (ADF), and Phillip Perrron (P-P) Test) suggest that the series are non-stationary at levels but they turn out to be stationary at first difference. Given the majority of the test result, it is quite reasonable to consider the series as non-stationary at levels or I (1).

4.2.3.2 Estimation of ARDL Model & Bound Test

Table 4: Full Information ARDL Estimate Results

ARDL Estimates

ARDL (2,1,0,1,0,0,0,0,0) selected based on Akaike Infor Criterion

The Dependent Variable is LIQ.

Regressor	Coefficient	Standard Error	T-Ratio	Prob.
LIQ (-1)	0.7163	0.1606	4.4588	0.0002
LIQ (-2)	-0.5766	0.1414	-4.0766	0.0004
DEP	-0.8653	0.2179	-3.9697	0.0006
DEP (-1)	1.0732	0.1985	5.4047	0.0000
CRD	-1.5520	0.6420	-2.4175	0.0236
CA	5.9379	2.6706	2.2233	0.0359
CA (-1)	-7.1462	2.9372	-2.4329	0.0228
AST	1.5857	0.5475	2.8962	0.0079
M2	-0.6359	0.3867	-1.6442	0.1132
GOVEX	-0.4477	0.2447	-1.8296	0.0798
RMT	4.0011	1.6228	2.4656	0.0212
DB	-0.9407	0.7244	-1.2984	0.2065
C	-112885	52727.24	-2.1409	0.0426
R^2	0.90	D- W Stat = 1.53		
Adjusted R^2	0.86	F. Stat = 19.74 (0.000)		

Table 4, indicates that the overall goodness of fit of the estimated ARDL equation is significant as shown by the adjusted R^2=0.73. The D-w value of 1.39 confirms that there is no serial correlation problem.

Table 5: Bound Test (F-Version) Results

Variables	F- statistics	Cointegration	Lag Optimal
	13.979	Cointegration	(2,1,0,1,0,0,0,0,0)
	Critical Value	Lower Bound I (0)	Upper Bound I (1)
F (LIQ | DEP, CRD, CA, AST, M2, GOVEX, RMT, DB)	1%	2.62	3.77
	5%	2.11	3.15
	10%	1.85	2.85

To test whether the long-run equilibrium relationship exist between the variables, bounds test (F-version) for cointegration is carried out. The F-Statistics is then compared with the critical values provided by Pesaran et al., (2001). If the computed F-statistics is higher than the appropriate upper bound of the critical value, the null hypothesis of no cointegration is rejected, if it lies within the lower and upper bounds, the result is inconclusive, and if it lies below the lower bound, the null hypothesis cannot be rejected. F-statistics, presented in Table 5, lies above the upper critical value of 3.77, which rejects the null hypothesis of no cointegration. Since series are cointegrated they exhibit long run relationship. Even if there are shocks in the short run which may affect the movement in the individual series they would converge with time in the long run. Hence, we estimate both long run and short run models.

4.2.3.3 Diagnostic Testing

The ARDL model tries to find the Best Linear Unbiased Estimator (BLUE) and thereby diagnostic tests need to be conducted.

Table 6: Results of Diagnostic Test

	Test Statistics	F Statistics	Prob. Value
A.	Serial Correlation Test	0.4527	0.6417
B.	Functional Form Test	0.7269	0.4746
C.	Normality	1.3793	0.5017
D.	Heteroscedasticity	1.5480	0.1748

Table 6, shows that all the probability values are above 0.05 which shows that the model passes all the tests. Thus, the null hypothesis of the normality of residuals, the null hypothesis of no first-order serial correlation, the null hypothesis of homoscedasticity and null hypothesis of no miss specification of functional form is observed as shown above in the diagnostic tests.

4.2.3.4 Estimated Long Run Coefficients Using the ARDL Approach

Table 7: Estimated Long-run Coefficient using the ARDL Approach

ARDL (1, 0, 0, 0, 0, 0, 0, 0, 0) Selected based on AIC

The Dependent Variable is LIQ.

37 observations used for estimation from 2007 to 2021

Regressors	Coefficients	Standard Error	T-Ratio	Prob.
DEP	0.2416	0.2595	0.9311	0.3610
CRD	-1.8041	0.8843	-2.0401	0.0525
CA	-1.4045	2.3903	-0.5875	0.5623
AST	1.8432	0.7841	2.3508	0.0273
M2	-0.7392	0.4743	-1.5584	0.1322
GOVEX	-0.5204	0.2974	-1.7498	0.0929
RMT	4.6510	1.8812	2.4723	0.0209
DB	-1.0935	0.8800	-1.2425	0.2261
Constant	-131219.8	67576.25	-1.9418	0.0640

The long run coefficient is presented in the table 7. Since data is presented in log effects of interpretation of coefficient is a percentage nature.

Statistically banks assets and remittance as an independent variable has a significant impact on the liquidity of commercial banks in Nepal. The long run coefficient of banks assets is 1.8432 positive which implies that when banks deposit increase by 1 percent liquidity of commercial bank in Nepal increases by 1.8432 percent. Similarly, the long run coefficient of banks remittance is 4.6510 positive which also implies that when remittance increase by 1 percent liquidity of commercial bank increase by 4.6510 percent.

Banks credit, banks capital, money supply, government expenditure and public debt has negative coefficient implying that it has negative influence on the commercial banks

liquidity in Nepal whereas banks deposit is found to have positive coefficient implying that it has a positive influence on the banks liquidity being such all such six variables observed to be statistically not significant.

4.2.3.5 Error Correction Representation for the Selected ARDL Model

Table 8: Estimated ECM Using the ARDL Approach

ARDL (2, 1, 0, 1, 0, 0, 0, 0, 0) Selected based on AIC

The Dependent Variable is LIQ

37 observations used for estimation from 2007 to 2021

Regressors	Coefficients	Standard Error	T-Ratio	Prob.
D(LIQ(-1))	0.5766	0.0928	6.2116	0.0000
D(DEP)	-0.8653	0.0947	-9.1290	0.0000
D(CA)	5.9379	1.4411	4.1202	0.0004
ECM(-1)	-0.8602	0.0620	-13.8642	0.0000

Source : Author's Calculation using E views

After estimating long run equation, we obtain error correction version of the ARDL model. Table 8, presents the short run coefficient obtained from the ECM version of the ARDL model. Most of the variables have positive coefficient in the short run except credit. But their lag values have negative coefficient. While independent variable positively affects the liquidity, lag values of independent variables have negative effect on liquidity. While assets and credit have significant impact on liquidity other variables don't have significant impact. The error correction term ECM (-1) indicates the speed of adjustment restoring the equilibrium in the dynamic model. The ECM coefficient shows how quickly /slowly the relationship returns to its equilibrium path, and it should have statistically significant coefficient with negative sign. Also, a highly significant negative error correction term is proof of the existence of a stable long-term relationship (Byanjankar, 2020). The ECM coefficient is -0.8602 and it's statistically significant. This shows that short-run disequilibrium on the system converges to equilibrium at a speed of 86.02% per quarter.

4.2.4 Test for Stability

The stability diagnostics examine whether the parameters of the estimated model are stable across various sub- samples of the data (Shrestha and Bhatta, 2018). The CUSUM and

CUSUMSQ tests proposed by Brown, Durbin, and Evans (1975) have been applied to test the stability of the model. The CUSUM charts improve the ability to detect small shifts by charting a statistic that incorporates current and previous data values from the process.

Figure 11: Plots of CUSUM Statistics
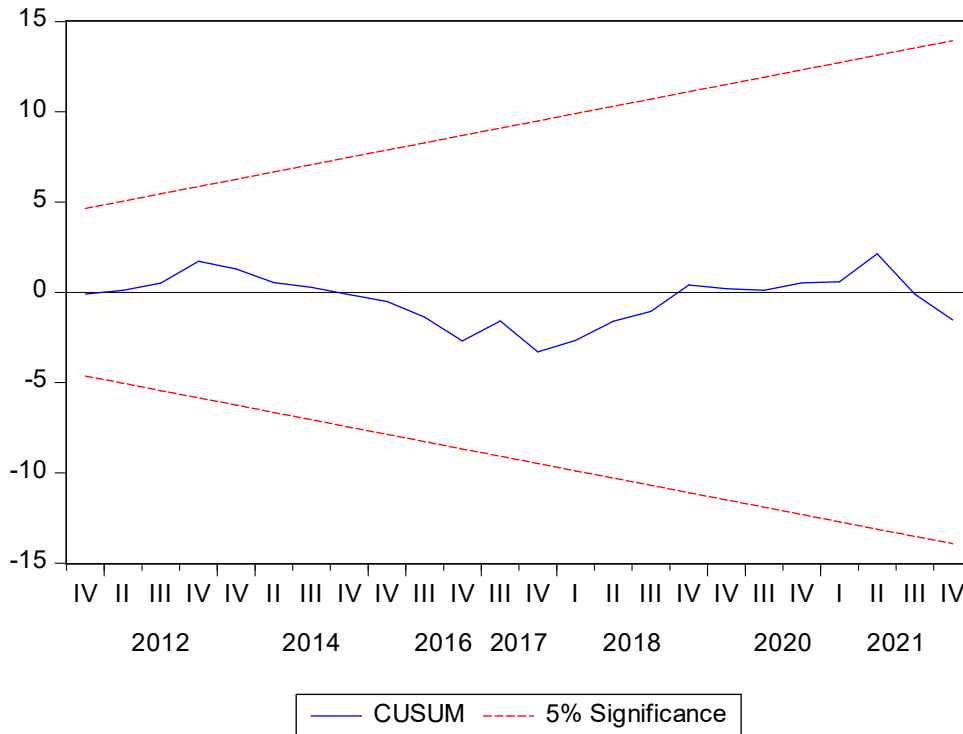
Source: Author's Calculation using E views

In the above figure, X-axis represents the time period and Y-axis represents the cumulative sum of square. Figure 11, presents the plot of the cumulative sum of recursive residuals. The result clearly indicates the absence of any instability of the coefficient during the investigated period because the plot is within the 5% critical bounds.

Figure 12: Plots of CUSUMSQ Statistics
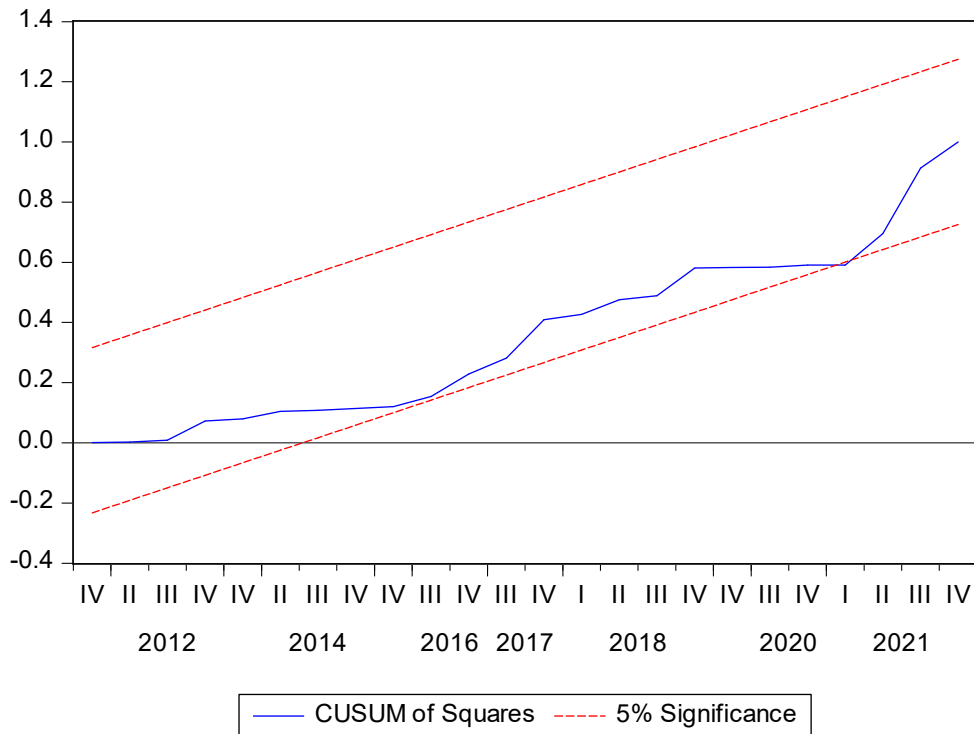
Source: Author's Calculation using E views

In the above figure, X-axis represents the time period and Y-axis represents the cumulative sum of squares. Figure 12, provides the plot of the cumulative sum of squares of recursive residuals. Similar to the previous test, the plot is within the 5% band supporting the stability of the model.

4.2.5 Interpretation of the Regression Results

Asset's impact on liquidity is determined by different factors. If regulatory requirement mandates banks to maintain certain liquidity based on ratio of assets the minimum liquidity will be maintained. But overall liquidity may be determined by the bank's perception of its size. When banks size gets bigger it may take unnecessary risk because it becomes "too big to fail" and knows that government will come to rescue. In that case it may increase its lending activity and liquidity decreases. This research shows that assets have a positive and

significant effect on liquidity in the long term. In the long term when assets increased by 1 percent liquidity increase by 1.8432 percent. The result shows that Nepalese commercial banks are risk sensitive and they avoid access risk by increasing credit portfolio corresponding to their assets.

It is believed that capital can affect liquidity in two ways. On one hand when banks capital increase it correspondingly increase the assets of the bank increasing liquidity. On the other hand, when capital is raised through bank financing it can decrease the liquidity of bank. This research shows that in the long run increase in capital by 1 percent decrease liquidity by 1.4045 percent. Effect of the capital is not that significant on banks liquidity.

As credit and liquidity are in the assets side of the balance sheet it is evident that when credit increase it may push banks to lend more owing to the income pressure so liquidity decreases. As evident from the above result in the long run when deposit increase by 1 percent liquidity increases by 0.2416 percent. Similarly, the effect of deposit in liquidity is not significant.

It is assumed that when government makes its expenditure through banking channel it will increase the liquidity of the banks. Similarly, when government expenditure increases the economic activity, increase in the demand for credit may decrease liquidity. Since, government is significant player in terms of economic activity the effect of government expenditure should be significant player in terms of economic activity, the effect of government expenditure should be significant. This is also proved by the results. In the long run 1 percent increase in government expenditure decreases liquidity by 0.5204 percent. Government expenditure has no significant effect on liquidity.

CHAPTER - V

MAJOR FINDINGS, CONCLUSION, AND RECOMMENDATIONS

The study aimed to assess analyze the trend of banks liquidity, the bank specific and macroeconomic variable of the liquidity and to examine determinants influencing the commercial bank's liquidity of Nepal. To conduct this study, this paper implemented auto regressive distributed lag model for liquidity and study depicted that external factor have the most effect on liquidity. Nonetheless, these studied indicators impacted positively in some cases and negatively in other based on the microeconomic and macroeconomic environment. On the basis of the findings of the study this chapter present the major findings and recommendation.

5.1 Major Findings

Liquidity basically depends on two class of dependent variables which includes one core variable so called bank specific variable or micro economic variable and next one is counter variable so called macro-economic variable. Bank specific variables as independent variable of banks liquidity includes banks deposit, banks credit, banks capital, banks assets, banks, funding costs, assets quality, interbank funding etc. such variables are within the control or limit of each bank. Similarly macro-economic variable it includes money supply, government expenditure, remittance, public debt, inflation, credit risk rate, GDP real growth rate, unemployment etc. such variables are beyond the reach or control of banks.

The study shows that there is no stable trend in case of banks liquidity and other independent variable as well. There is huge fluctuation in banks liquidity, liquid assets and government expenditure. Bank specific variables such as banks deposits, banks credits, banks assets and banks capital shows increasing trend with some little fluctuation whereas in case of macro-economic variable except for public debt other variables shows increasing trend.

This study assesses bank liquidity of the commercial bank's liquid assets to total assets in Nepal based on 15 years long from 2006 October to 2021 July. As a result, trend line of bank liquidity in the commercial banks is instable, fluctuating and declining. Its declining

trend indicates the risk of bank liquidity in the commercial bank and high chance of liquidity crunch on national economy. Descriptive statistic of bank liquidity in compare to bank's total assets shows the mean and standard deviation of 18.02% and 9.35% respectively.

The findings show that commercial banks in Nepal created a total of 322,489.99 million in liquidity in July 2021, approximately 2.67 times the total liquidity created in July 2006. Growth in liquidity was observed to be relatively slow in compared to deposit, loan, capital, assets, money supply, government expenditure, remittance, domestic borrowing and inflation as there was growth of 14.40 times in case of Deposit, 14.94 times in case of Loan, 30.33 times in case of Capital, 13.54 times in case of Assets, 14.84 times in case of Money Supply, 6.58 times in Government Expenditure, 9.76 times in Remittance and 8.88 times in Domestic Borrowing as compared with individual balances of July 2021 with July 2006.

Unit root test results show that variables included found to be mix of I (0) and I (1). Majority of the unit root test shows that the series not stationary at level but they turn out to be stationary at first difference. Study has used ARDL model has significant adjusted $R^2= 0.86$. Bound test results show that F value lies above the upper critical value showing long run relationship between variables. In the diagnostic test all the values are above 0.05. Thus, the null hypothesis of the normality of residuals, the null hypothesis of no first-order serial correlation, the null hypothesis of homoscedasticity and null hypothesis of no miss specification of functional form is observed. The short-run disequilibrium converges to the long-run equilibrium at a speed of 86.02% per quarter signifying a very quick adjustment process.

Bank Size (Assets) impacted significantly with the positively coefficient of 1.8432. The result is consistent with Tesfaye (2012), Malik and Rafique (2013) and Ahamed (2021). However, Lotto & Mwemezi (2015), Singh and Sharma (2016), Ahamad and Rasool (2017), Saha, Alam and Islam (2019) and Al- Homaidi et al., (2019) found that bank size negatively affect liquidity.

Remittance has statistically significant and positive impact on the domestic liquidity as they are directly deposited in the domestic banking system, thereby increasing the ability of banks to mobilize funds in the economy. Remittance has also impacted insignificantly

on bank's liquidity with positive coefficient of 4.651. Bista and Basnet (2020) also showed the similar result.

Domestic Credit has impacted on bank's liquidity with negative coefficient of 2.3866 and it's not statistically significant independent variable. Ahamed (2021) exhibited similar outcome.

The capital exhibits a insignificantly negative statistical impact on bank's liquidity with a negative coefficient of 1.4045. The findings show that the liquidity of bank decreases when bank holds more capital to handle unanticipated customer demands, losses or before being insolvent. The result is not in consistent with Vodova (2011), Munteanu (2012), Tesfaya (2012), Ahamed (2021) and Tasnova, N. (2022).

Credit has impacted insignificantly on bank's liquidity with negative coefficient of 1.8041. The findings are in harmony with Subedi and Neupane (2013), Lotto and Mwemezi (2015) and Ahamed (2021).

The study assumed a positive influence of the government expenditure on bank's liquidity, but the reveal a insignificant influence with a negative coefficient of 0.5204. It caused liquidity to diminish in the long run. The result is not in consistent with Bista and Basnet (2020).

The study showed an insignificant influence of banks deposit, banks credit, banks capital, money supply, government expenditure and domestic borrowing on banks liquidity.

Money Supply has impacted insignificantly on bank's liquidity with negative coefficient of 0.7392.

The results reveal an insignificant influence of deposit on liquidity with a positive coefficient of 0.2416. This shows that banks rely on non-deposit source to have liquidity such as capital or borrowing. Singh and Sharma (2016) and Al-Quadh. (2020) found deposit growth have a positive significant impact on bank's liquidity. However, Shah et al., (2018) rejects the arguments that increase in deposit increases the liquidity.

This research shows that after remittance, banks assets have the most positive and significant impact on liquidity. Similarly, public debt and credit have negative and

significant impact on liquidity. It is because Nepalese commercial banks rely mainly on credit for income and remittance for economy. Therefore, whenever banks have ample liquidity, they disburse loan and liquidity is decreased.

In the long run, money supply has insignificant negative relation with liquidity. It shows that increase in money supply increase the economic activity and can decrease in the liquidity slightly.

5.2 Conclusion

The specific objective of the study was to examine the long run relationship between the dependent variable liquidity and independent variables divided into two groups; one banks specific variables including banks deposit, banks credit, banks capital and banks assets and similarly another group of macro-economic variables which include money supply, government expenditure, remittance and public debt.

Previous studies report shows that in case of bank specific variable, banks deposit, banks capital and banks asset have a positive relation with bank liquidity whereas banks credit has negative relation with banks liquidity. In case of macro-economic variables, previous studies shows that government expenditure and remittance have a positive relation with the bank's liquidity whereas money supply and public debt have a negative relation with the bank's liquidity.

The study concludes that there is long run relationship between the independent variable and dependent variables of the study, in bank specific variable banks assets has statistically significant positive effect on the bank's liquidity and in macro-economic variables remittance has statistically significant positive effect on the bank's liquidity and short run disequilibrium converges to the long run equilibrium very quickly.

5.3 Recommendations

The empirical outcomes indicated public debt, remittance, capital and bank credit are the most significant predictor of bank liquidity in Nepal. The result revealed that capital leads the way to higher liquidity and when banks keep a higher capital, it is expected that banks will have a better position to absorb the liquidity shock and thus it provides greater safety for banks.

Remittance having most significant positive influence on the domestic liquidity of Nepal, a major portion of remittance are not channelized through the banking sector combined with decreasing official inflow has contributed to reduced ability of Banks and Financial Institutions to mobilize funds in the economy which has led to a liquidity crunch.

Additionally, increased government expenditure enhances the business and other economic activities that lead to a decrease the liquidity as other economic activities demand more money. Nepal Rastra Bank – the central bank of Nepal needs to implement a tight monetary policy to handle the unwelcome effects of inflation on Nepalese Bank's liquidity.

The government needs to administer sustainable macroeconomic policies that will foster sustainability of economic growth and favor business interests that will make practical and effective use of industry's capacity utilization. The economic regulators will be revitalized to utilize the study findings for modification and aligning present regulation policies and framework especially in the Nepalese scenario.

The regulatory authority must consider the bank specific factors for liquidity management, since they are under their control and setup a new better policy regarding liquidity management. Central bank of Nepal needs to implement tight monetary policy as per the market and situation of the economy. Tight monetary policy environment reduces money supply as the central bank increases federal reserve funds rate and sell securities, liquidity reserve in banking system declines. The study, therefore recommends that policymakers need to readjust the bank specific and macroeconomic determinants bank's capital, bank's credit, government expenditure, remittance and public debt that influence bank liquidity.

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APPENDIX - A

Name of Commercial Banks of Nepal

S.N.	Name	Operation Date (A.D.)	Head Office
1	Nepal Bank	1937/11/15	Dharmapath, Kathmandu
2	Agriculture Development Bank	1968/01/21	Ramshahpath, Kathmandu
3	Nabil Bank	1984/07/12	Beena Marg, Kathmandu
4	Nepal Investment Bank	1986/03/09	Durbarmarg, Kathmandu
5	Standard Chartered Bank Nepal	1987/02/28	Nayabaneshwor, Kathmandu
6	Himalayan Bank	1993/01/18	Kamaladi, Kathmandu
7	Nepal SBI Bank	1993/07/07	Kesharmahal, Kathmandu
8	Nepal Bangladesh Bank	1994/06/06	Kamaladi, Kathmandu
9	Everest Bank	1994/10/18	Lazimpat, Kathmandu
10	Kumari Bank	2001/04/03	Dubarmag, Kathmandu
11	Laxmi Bank	2002/04/03	Hattisar, Kathmandu
12	Citizen Bank International	2007/04/20	Narayanhitipath, Kathmandu
13	Prime Commercial Bank	2007/09/24	Kamalpokhari, Kathmandu
14	Sunrise Bank	2007/10/12	Gairidhara, Kathmandu
15	Century Commercial Bank	2011/03/10	Putalisadak, Kathmandu
16	Sanima Bank	2012/02/15	Nagpokhari, Kathmandu
17	Machhapuchhre Bank	2012/09/07*	Lazimpat, Kathmandu
18	NIC ASIA Bank	2013/06/30*	Thapathali, Kathmandu
19	Global IME Bank	2019/09/04*	Kamaladi, Kathmandu
20	NMB Bank	2019/09/28*	Babarmahal, Kathmandu
21	Prabhu Bank	2016/02/12*	Babarmahal, Kathmandu
22	Siddartha Bank	2016/07/21*	Hattisar, Kathmandu
23	Bank of Kathmandu	2016/07/14*	Kamalpokhari, Kathmandu
24	Civil Bank	2016/10/17*	Kamladi, Kathmandu
25	Nepal Credit and Commerce Bank	2017/01/01*	Bagbazar, Kathmandu
26	Rastriya Banijaya Bank	2018/05/02*	Singhadubarplaza, Kathmandu
27	Mega Bank Nepal	2018/05/13*	Kamaladi, Kathmandu

Source: *List of BFIs As on Mid July,2021 (NRB)*

Joint operation date after merger

APPENDIX - B

Individual Status of Bank on Liquidity Position of Bank

S.N.	Name of Commercial Banks of Nepal	Net Liquidity (In %)
1	Nepal Bank	26.81
2	Rastriya Banijaya Bank	37.10
3	Agriculture Dev Bank	36.21
4	Nabil Bank	23.49
5	Nepal Investment Bank	25.90
6	Standard Chartered Bank	42.68
7	Himalayan Bank	26.51
8	Nepal SBI Bank	24.97
9	Nepal Bangladesh Bank	39.25
10	Everest Bank	42.69
11	Bank of Kathmandu	28.36
12	Nepal Credit and Commerce Bank	23.52
13	NIC ASIA Bank	20.64
14	Machhapuchhre Bank	27.22
15	Kumari Bank	23.25
16	Laxmi Bank	22.40
17	Siddartha Bank	25.46
18	GlobalIME Bank	29.89
19	Citizen Bank International	26.36
20	Prime Commercial Bank	25.12
21	Sunrise Bank	24.74
22	NMB Bank	27.52
23	Prabhu Bank	27.77
24	Mega Bank	22.54
25	Civil Bank	22.31
26	Century Commercial Bank	27.68
27	Sanima Bank	22.15

Source: *Key Financial Indicator of Commercial Bank as on Ashad End 2078 (NRB)*

APPENDIX - C

Quarterly Data for the Commercial Banks of Nepal

Year	Mid-Month	LIQ	DEP	CRD	CA	AST	M2	GOVEX	RMT	DB
2007	2006 October	119482	302448	253971	17050	426932	360616	19543	24507	0
	2007 January	115831	310032	253424	17538	408035	367717	25226	24119	3680
	2007 April	121501	319969	266701	18730	433502	380223	23912	27756	6350
	2007 July	130780	334453	272634	20017	441468	395318	56641	48834	7862
2008	2007 October	125556	348315	290791	20528	455977	390014	30029	27842	1875
	2008 January	128864	372411	315614	25381	500654	402174	28254	29215	6325
	2008 April	137696	389851	325365	26832	531988	417998	32033	36789	5125
	2008 July	151110	421523	345135	31750	553275	495377	59646	48834	7171
2009	2008 October	159210	447171	375955	32562	605368	520673	29305	46578	0
	2009 January	164379	476125	384205	34190	626799	550007	36151	47723	8700
	2009 April	165723	492806	407391	37013	651444	572912	41598	56119	0
	2009 July	194608	550677	442732	40738	721509	630521	98658	59277	9717
2010	2009 October	177434	568952	469237	41344	755583	661928	39698	51752	0
	2010 January	172642	576330	495877	44176	750488	673379	46592	54437	260
	2010 April	177807	575910	510616	45604	764119	673737	53807	58739	2100
	2010 July	214047	620608	505124	46890	787116	719599	108276	66796	27554
2011	2010 October	204527	613856	528561	50145	810189	727394	44682	59122	0
	2011 January	191815	624388	549420	55790	815474	724083	36166	59325	4500
	2011 April	58313	642473	562391	56312	841690	743566	76410	63390	4000
	2011 July	74723	566171	554321	58294	868618	921320	120421	71713	25180
2012	2011October	92790	594728	584175	58637	895789	976855	43374	75882	0
	2012 January	84210	622721	592415	60348	946579	1016066	65096	86490	7000
	2012 April	84008	648811	620237	62555	977941	1046402	73994	85810	11000
	2012 July	315012	700053	647775	65983	1052450	1130302	123458	111371	18410
2013	2012 October	296999	712593	683875	66229	1089436	1165413	40901	97717	0
	2013 January	294069	733945	723709	73694	1108923	1184709	54188	99981	0
	2013 April	296805	764315	749797	77364	1156103	1223574	80464	104883	0

	2013 July	361955	820644	780868	77548	1242881	1315376	170980	132000	19042
2014	2013 October	372025	864291	811877	80850	1300531	1388925	56971	135033	0
	2014 January	355813	879415	850864	82680	1345602	1433481	77305	130589	9932
	2014 April	358436	904447	886982	83277	1404912	1478347	93549	132175	50
	2014 July	403477	949595	921419	87334	1467151	1565967	187615	145495	10000
2015	2014 October	356274	988104	993108	91925	1528085	1613530	55252	143294	0
	2015 January	339136	1021688	1050891	95647	1572477	1657403	98467	134189	0
	2015 April	371021	1040188	1070152	97082	1632245	1715905	111552	141769	0
	2015 July	440521	1138949	1119595	98300	1753726	1877801	234693	150230	42423
2016	2015 October	426866	1174765	1144971	99404	1800848	1962194	49395	166421	0
	2016 January	137761	1214154	1192120	109993	1870005	2047570	111006	157271	0
	2016 April	157191	1270844	1290828	113911	1990282	2121430	127134	157993	42582
	2016 July	182768	1412722	1403659	122538	2141216	2244578	283035	183378	45192
2017	2016 October	474068	1464627	1461348	133187	2226806	2364968	95161	171796	0
	2017 January	486847	1541228	1603588	147398	2335159	2425538	153041	170436	0
	2017 April	503695	1611667	1670502	161831	2401374	2464390	171730	169698	30254
	2017 July	251059	1795157	1751212	186759	2583028	2591702	373978	183520	58083
2018	2017 October	184172	1844396	1824871	196061	2687628	2699674	138836	176323	57540
	2018 January	181149	1905884	1945068	216200	2750369	2764806	226110	164219	57248
	2018 April	183372	1998705	2026159	224558	2818915	2873803	278690	199833	20888
	2018 July	257357	2150740	2130748	231457	3069231	3094466	385386	214681	9073
2019	2018 October	147458	2211373	2285502	235240	3187644	3202641	170952	242171	0
	2019 January	179680	2338674	2384681	242572	3341690	3294006	168340	201192	0
	2019 April	183457	2380153	2451268	247604	3432056	3382985	257325	209823	0
	2019 July	240684	2506618	2497936	252260	3611925	3582137	471051	226083	96382
2020	2019 October	228646	2505867	2634110	258987	3747794	3696691	172325	230243	0
	2020 January	202560	2633004	2735111	266472	3863859	3770560	205840	217015	0
	2020 April	187445	2715719	2864909	277155	4072110	3901117	259848	179646	55004
	2020 July	361188	2936063	2909580	285293	4369588	4230969	400012	248122	194642
2021	2020 October	338499	3634283	3032667	285307	4576717	4467986	176991	258858	33000
	2021 January	1001818	3761136	3230867	309616	4866525	4637223	227209	236450	24000
	2021 April	977403	3897300	3549588	319349	5093234	4833170	269882	233715	55515

| | 2021 July | 322489 | 4167463 | 3690886 | 320629 | 5392526 | 5154853 | 486187 | 232029 | 111493 |

Source: *Quarterly Economic Bulletin (NRB)*