



Impact of Liquidity on Profitability of Nepalese Commercial Banks

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Abstract

The study sought to find out the relationship between the liquidity and the profitability of commercial banks in Nepal. The article has taken sample of 8 commercial banks covering the period from 2014 to 2019. The return on assets and net income to loan and advances were taken as dependent variables and credit to deposit ratio, asset quality, interest expenses to deposit and inflation as independent variables. The secondary sources of data have been used from annual reports of the banks and supervision report of Nepal Rastra Bank. The regression models are estimated to test the significance and effect of bank liquidity on profitability of Nepalese commercial banks.

Correlation between credit deposit ratio and return on assets found to be positive indicating higher the credit deposit ratio higher would be the return on assets. Asset quality ratio is found to be negative indicating higher the assets quality i.e non performing assets in the bank lower would be the return on assets. In study of overall regression model, Net income to total loan & advances has significant and positive relation with credit to deposit ratio, asset quality, interest expenses to deposit and inflation, which reveals that increase in these variables leads to increase in Net profit to total loan and advances. Similarly, Return on assets has positive and significant relation with credit to deposit ratio & Interest expenses to deposit ratio which means that increase in credit to deposit ratio will lead to increase in ROA of Nepalese commercial banks.

Key words: Liquidity, Profitability, Inflation, Credit to Deposit ratio.

I. Introduction

Bank liquidity means the ability of the bank to maintain sufficient funds to pay for its upcoming obligations, so it can finance its transactions efficiently. Liquidity is the degree to which an asset or security can be quickly bought or sold in the market without affecting the asset's price (Investopedia.com). Liquidity is the ability of bank to pay its short-term

obligation to its depositor and creditors (Eljelly, 2004). The role of banking sector is very important for a healthy financial system within which liquidity is one of major factor.

Liquidity refers to the capacity of an institution to generate or obtain sufficient cash or its equivalent in a timely manner at a reasonable price to meet its commitment as they fall due and to fund new business opportunities as part of going-concern operations. The bank exchanging the less liquid assets to more liquid assets to maintain high liquidity position, and can meet the liquidity needs of their depositors. There are two types of uncertainty concerning liquidity needs. The first is that each individual bank is faced with liquidity risk. At any given date its customer may have more or less liquidity needs. The second type of uncertainty that bank face is aggregate liquidity risk (Franklin and Elena, 2008). Liquidity will help a firm to avoid a situation where a firm will be forced to liquidate with its attendant problems of selling assets at distressed prices and the extra fees paid to lawyer, trustees in bankruptcy and liquidator on liquidation.

Liquidity is not generated properly, and then it can lead to insolvency in case of low liquidity and low profitability in the case of high liquidity. Bank liquidity indicates that there should be balance between inflow and outflow of the cash. If bank is unable to follow or maintain the equilibrium, it ultimately leads to the liquidity risk. Liquidity risk arises when banking and financial institution is unable to fulfill the present demand of the customers. When the liquidity risk increases, there is a high possibility of bankruptcy. Over a past few years the global expansion of banking and financial institution has given challenges and complexity for financial activities and financial instruments. Liquidity is the key concern for banking and financial institution in present scenario, basically after economic crisis of 2008. There is wide agreement that insufficient liquidity buffer were the root causes of crisis and ongoing disruption of world financial system, making the improvement of liquidity risk analysis and supervision of key issue for year to come (Bonner, 2013).

II. Theoretical Framework

Diamond and Dybvig (1983) stated that if liquidity is not generated properly, then it can lead to insolvency (in case of low liquidity) and low profitability (in the case of high liquidity). Rochet (2008) indicates two reasons for liquidity regulation, from micro point of view liquidity regulations prevent bank's bankruptcy and damage of depositors' interest by regulating liquidity buffer of banks; from macro point of view, liquidity regulation help maintenance of financial system stability. The underlying query is that how does liquidity

affect profitability in commercial bank? To address this, various theories have been examined to provide awareness for the connection between liquidity and profitability of banks.

A firm will not be able to fulfill its immediate obligations when it is making low profits due to the high liquidity that it gains. This will mean that funds are held in non-liquid assets and could not be used for productive activities, hence lowering the profitability. Accordingly, liquidity creation can positively relate to bank profitability. Amazingly, few works have directly studied the relationship between liquidity creation and bank profitability. Among them, Berger and Bouwman (2009) advise that the more the liquidity is created, the higher the net surpluses are shared among stakeholders and nonbank public. Thus, liquidity creation positively affects the bank value.

Bordeleau and Graham (2010), discusses the relationship between bank liquidity and profitability by comparing US and Canada banks, indicates that although liquidity assets tend to gain less profit, the behavior of banks increasing liquidity assets against default or bankruptcy may lower the cost produced due to mismatching of assets and liabilities and offset the profit loss caused by owing more liquidity assets, hence there is a positive relationship between bank liquidity and profitability to some extent. But when the liquidity assets banks hold exceeds the threshold, too much liquidity may cause idle use of bank funds, which leads to inefficiency of financial operations and investment management, and in this circumstance the relationship of liquidity and profitability becomes negative.

Shrestha (2012) found an association between liquidity and profitability of commercial banks in Nepal, with data from 2003/04- 2009/10 of 8 private commercial banks taken into consideration.

Rasul (2013) pointed out that the essence of liquidity management problem arises from the fact that there is trade-off between liquidity and profitability and mismatch between demand and supply. He conducted a study, investigated how liquidity influences profitability of Islamic banks in Bangladesh. Its result concluded that cash and due from banks to total assets ratio is significant with all profitability variables used in the study whereas cash and due from banks is found significant with all profitability variables used by the study except ROE.

Cucinelli (2013) while studying the relationship between liquidity risk and probability of default with a sample of 575 listed and non-listed banks and based on the OLS regression which results indicate that there is no significant association between liquidity and probability of default in the long term. Abdullah & Jahan (2014) conducted study taking ROA and ROE as dependent variables and Loan Deposit Ratio, Deposit Asset Ratio and Cash Deposit Ratio are selected as independent variables and found that there is no significant relationship between liquidity and profitability. Marozva (2015) posits that a dilemma in liquidity

management is finding a balance between liquidity and profitability since these two are inversely associated, and thus profits diminishes with increase in liquidity vice versa. Furthermore, Pradhan (2016) found liquidity as the major determinant of profitability of Nepalese commercial banks.

Hakimi & Zaghdoudi (2018) applied panel data with precisely random effect regression, results show that liquidity risk decreases significantly Tunisian bank performance which further concluded that inflation and international financial crisis act negatively and significantly on bank performance. Khasharmeh (2018) found that profitability of Islamic banks depends to a large extent upon liquidity and concluded that liquidity strongly affects profitability of Islamic banks in Bahrain over the periods of study.

Identification of variables

Dependent variables

There are various measures to determine bank profitability such as return on capital, return on asset, return on equity, net profit margin, return on equity, cash flow to assets, cost of income ratio, net interest margin, risk-adjusted return on capital, price-earnings ratio, total share return, etc. Profitability of banks is driven by its ability to generate sufficient earnings as well as reduce the operational costs. Ratios like the net interest margin (NIM), return on equity (ROE), Net Income to Total Loan & Advances (NPTL) and returns on asset (ROA) are used in summarizing large quantities of financial data and aid in making qualitative judgment about a firm's ability to generate profits.

Independent variables

In order to reflect the relation between bank profitability and liquidity, the variables like asset quality, credit to deposit ratio, Interest Expenses to Deposit & Inflation are used as measure variables of liquidity.

Asset Quality (AQ): Asset Quality is measured as the ratio of non-performing loan (NPL) to total loan. The quality of outstanding loan i.e. smaller NPL ratio indicates smaller losses for banks and vice-versa. Higher NPL reduces cash flow and create the risk of having insufficient cash to meet payment or obligations in a timely and cost effective way, which in turn influences liquidity management and thus affects bank profitability.

Credit to Deposit Ratio (CD): CD Ratio is termed as loan to deposit ratio measures the bank's capability to fulfill its financial obligations through deposits, it is calculated as total

loan divided by total deposits, and banks with lower loan to deposit ratio tend to have higher liquidity. If the ratio is too high, it means that the bank may not have enough liquidity to cover any unforeseen fund requirements while lower CD ratio indicates cost of fund.

Interest Expenses to Total Deposits (IED): This ratio of Interest Expenses to Total Deposit measures prime cost of the bank. This ratio of Interest Expenses to Total Deposit explains the importance of a bank's ability to pay interest to its depositors and helps management to monitor cost of fund on deposit. It indicates the banks cost over the liquidity position.

Inflation rate (INF): If inflation increases in a country which tends to decrease the returns of all business units. In such specific situation, the banks makes less loans, resource allocation is less efficient, as well as reduces the intermediary activities of banks. Hence, rise in inflation in a country will increase the bank liquidity.

The effect of inflation on bank profitability relies to wages and other operating expenses grow at a faster rate than the inflation or not. Studies like Bourke (1989) and Molyneux and Thornton (1992) have found a positive relationship between inflation and profitability. All the same, if inflation is not anticipated and banks do not adjust their interest rates correctly, the costs may increase faster than revenues and henceforth affect bank profitability adversely. The effect of inflation on bank profitability relies to wages and other operating expenses grow at a faster rate than the inflation or not.

III. Research Methodology

This study is based on secondary data which has been collected from NRB, banks annual reports and Company Registrar. Among 27 commercial banks 8 banks which have not gone through merger, acquisition or up gradation till now were taken for analysis purpose. They are listed as:

Table 1

List of banks along with study period and number of observations

S.N.	Name of the bank	Study Period	Observation
1.	Nepal Bank Limited	2014/15- 2018/19.	5 Years
2.	Nepal Investment Bank	2014/15- 2018/19.	5 Years
3.	Siddhartha Bank Limited	2014/15- 2018/19.	5 Years
4.	Standard Chartered Bank Limited	2014/15- 2018/19.	5 Years
5.	Himalayan Bank Limited	2014/15- 2018/19.	5 Years

6.	Nepal SBI Bank Limited	2014/15- 2018/19.	5 Years
7.	NIC Asia	2014/15- 2018/19.	5 Years
8.	Bank of Kathmandu Limited	2014/15- 2018/19.	5 Years
	Total	-	40

Thus, the study is based on 40 observations.

Table 2

Details of Variables

Variables	Measurements	References	Classification
ROA	Ratio of net income to total assets	(Landskroner & Paroush, 2011)	Proxy of Profitability (Dependent variable)
NPTL	Net Income to Total Loan & Advances	(Moussa, 2015)	Proxy of Profitability (Dependent variable)
CD	Total loan to total deposit	(Choudhry et al., 2012), (Dogan, 2013).	Degree of Conversion of Deposits into Credits (Independent variable)
AQ	Non-performing loan to total loan	(Pradhan & Shrestha, 2018)	Assets/Loan Quality (Independent variable)
IED	Interest Expenses to Total Deposits and Borrowings	(Moussa, 2015)	Bank's Ability to measure cost of fund (Independent variable)
INF	Consumer inflation rate	(Pasiouras and Kosmidou, 2007).	Consumer Price Inflation (Independent variable)

Source: Self Elaborations

The regression models for the analysis of relation between the variables are listed below:

$$Y = \beta_0 + \beta_1 CD + \beta_2 AQ + \beta_3 IED + \beta_4 INF + \varepsilon$$

$$\text{MODEL 1: } NPTL = \beta_0 + \beta_1 CD + \beta_2 AQ + \beta_3 IED + \beta_4 INF + \varepsilon$$

$$\text{MODEL 2: } ROA = \beta_0 + \beta_1 CD + \beta_2 AQ + \beta_3 IED + \beta_4 INF + \varepsilon$$

Where, Y= Dependent Variable, β_0 = Intercept of dependent variable, β_i = coefficient of independent variables (i= 1 to 5), ε = error terms.

Descriptive statistics

The descriptive statistics used in this study consists of mean, standard deviation, minimum and maximum values associated with variables under considerations. The descriptive statistics are summarized on table 3.

Table 3
Descriptive statistics

Variables	Mean	Std. Deviation	Minimum	Maximum
ROA	1.76	0.51	0.55	2.79
NPTL	2.90	1.35	0.91	7.00
CD	79.44	9.52	48.92	91.70
AQ	1.31	1.19	0.04	3.98
IED	4.17	1.89	1.01	7.33
INF	6.05	2.50	4.15	9.93

The table shows that ROA ranges from 0.55 to 2.79 with a mean of 1.76 and standard deviation of 0.51. The NPTL ranges from 0.91 to 7.00 with a mean of 2.90 and standard deviation of 1.35. Similarly, the descriptive statistics for the independent variable shows that CD ranges from 48.92 to 91.70 with an average of 79.44 and standard deviation of 9.52. The AQ ranges from 0.04 to 3.98 along with average of 1.31 and standard deviation of 1.19. The IED ranges from 1.01 to 7.33 with average of 4.17 and standard deviation of 1.89. The INF ranges from 4.15 to 9.93 with an average of 6.05 and standard deviation of 2.50.

Correlations Analysis

Correlation coefficient analysis has been attempted to find the statistical relationship between dependent and independent variables and the results are presented below:

Table 4
Correlation coefficients for ROA and determinant's of liquidity

Variables	ROA	CD	AQ	IED	INF
ROA	1				
CD	0.868	1			
AQ	-0.938	-0.693	1		
IED	0.357	0.765	-0.096	1	
INF	-0.407	-0.733	0.249	-0.756	1

The results of correlation matrix revealed that Return on Assets is negatively related with Assts Quality & Inflation and positive to Credit to Deposit Ratio & Interest Expenses to Deposits.

Table 5
Correlation coefficients for NPTL and determinant's of liquidity

Variables	NPTL	CD	AQ	IED	INF
NPTL	1				
CD	.913*	1			
AQ	-0.516	-0.693	1		
IED	0.801	0.765	-0.096	1	
INF	-0.514	-0.733	0.249	-0.756	1

The results of correlation matrix revealed that Net Profit to Total Loan & Advances is negatively related with Assts Quality & Inflation and positive to Credit to Deposit Ratio & Interest Expenses to Deposits.

Regression Analysis

In order to tests the statistical significance and strength of the result, regression models has been used. Following two tables represent analysis of the secondary data. Table 6 and 7 presents the regression result for the dependent variable and independent variables.

Table 6 shows regression analysis results of variables based on panel data of 8 commercial banks. This table shows regression result of model one as: $NPTL = \beta_0 + \beta_1CD + \beta_2AQ + \beta_3IED + \beta_4INF + \epsilon$, in the form of simple and multiple regressions. The reported values are intercepts and slope coefficients of respective explanatory variables with p value in parenthesis. Dependent variable is net interest margin (NIM) and independent variables are; Credit to deposit ratio (CD), Asset quality (AQ), Liquidity ratio (LR) and Inflation rate (INF).

Table 6
Regression analysis of Net Profit to Total Loan & Advances (NPTL)

Independent Variables	Beta Coefficient	Sig	VIF
Constant	-3.547	0.12	
CD	0.081	0.03	1.00
IED	0.225	0.60	1.92
AQ	0.247	0.61	2.41
INF	0.337	0.44	2.16

R Squared	0.83
Adjusted R Squared	0.78
F- Statistics	15.11
Prob	0.03

In this table, the value of R square is 0.83 means that 83.00 % of the total variation in ROA is explained by the variables Credit to Deposit Ratio, Assets Quality, Interest Expenses to Deposits and Inflation. It means that by knowing these independent variables Net Income to Total Loan & Advances of commercial banks can be predicted. Furthermore, the value of adjusted R square is 0.78 shows that the study has accounted for 78.00% of the variance in NPTL. Likewise, it is observed that value of F- statistics is 15.11 and level of significance is less than 0.05 which means that there is significant impact of at least one of the independent variables on NPTL of banks. The results indicate that profitability of Nepalese commercial banks in terms of NPTL is positively affected by Credit to Deposit Ratio, Assets Quality, Interest Expenses to Deposits and Inflation. Further VIF is less than 10, thus it can be concluded that there is no collinearity between the predicted variables. Further, Credit to Deposit Ratio is found significant independent variable for defining Net Profit to Total Loan & Advances.

Table 7 shows regression analysis results of variables based on panel data of 8 commercial banks This table shows regression result of model one as: $ROA = \beta_0 + \beta_1CD + \beta_2AQ + \beta_3IED + \beta_4INF + \epsilon$, in the form of simple and multiple regressions. The reported values are intercepts and slope coefficients of respective explanatory variables with p value in parenthesis. Dependent variable is Return on assets (ROA) and independent variables are; Credit to deposit ratio (CD), Asset quality (AQ), Liquidity ratio (LR) and Inflation rate (INF).

Table 7

Regression analysis of Return on assets (ROA)

Independent Variables	Beta Coefficient	Sig	VIF
Constant	2.63	0.00	
CD	0.42	0.13	1.92
IED	0.27	0.23	1.01
AQ	-0.668	0.02	1.00
INF	-0.185	0.48	1.07
R Squared	0.88		
Adjusted R Squared	0.84		

F- Statistics	22.04
Prob	0.02

In this table, the value of R square is 0.88 means that 88.00 % of the total variation in ROA is explained by the variables Credit to Deposit Ratio, Assets Quality, Interest Expenses to Deposits and Inflation. It means that by knowing these independent variables Return on Assets of commercial banks can be predicted. Furthermore, the value of adjusted R square is 0.84 shows that the study has accounted for 84.00% of the variance in ROA. Likewise, it is observed that value of F- statistics is 22.04 and level of significance is less than 0.05 which means that there is significant impact of at least one of the independent variables on ROA of banks. The results indicate that profitability of Nepalese commercial banks in terms of ROA is positively affected by Credit Deposit ratio & Interest Expenses to Deposit whereas it is negatively affected by Assets Quality and Inflation. Further VIF is less than 10, thus it can be concluded that there is no collinearity between the predicted variables. Further, Assets Quality is found significant independent variable for defining Return on Assets.

IV. Results and Conclusion

The major concern of this study was to figure out if the amount of liquidity maintained by the banks effect their profitability as these two issues are much important to the stakeholders of the banks. The shareholders desire maximum profitability as a return on their investment, while the depositors wants for the maximum liquidity as a guarantee for safety and ability to pay their money on demand. Statistical significance of liquidity on profitability can be a great factor for potential investors too. The influence of banks liquidity cannot be negligible when considering profit motive.

In study of overall regression model, Net Income to Total Loan & Advances has significant and positive relation with credit to deposit ratio, asset quality, Interest Expenses to Deposit and Inflation, which reveals that increase in these variables leads to increase in NPTEL. Similarly, ROA has positive and significant relation with credit to deposit ratio & Interest Expenses to Deposit Ratio which means that increase in credit to deposit ratio will lead to increase in ROA of Nepalese commercial banks.

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