Impact of Bank Specific and Macroeconomics Variables on Liquidity of Nepalese Commercial Banks

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Abstract

The objective of this study is to examine the liquidity determinants of Nepalese commercial banks. The study has applied ordinary least square (OLS) regression models to a panel data of commercial banks for the period from 2011/12 to 2016/17. The banks liquidity (liquid asset to total asset and total credit to total loan ratios) was taken as a dependent variable which functioned against both bank-specific and macroeconomic determinants. The present study seeks to fill the existing gap by empirically analyzing bank specifics variables such as return on equity (ROE), non-performing loan ratio (NPL) and size (LnTA), and macroeconomic determinants such as economic activity (GDP), inflation rate (INF). The convenience sampling method was used in choosing the banks for the study. This study has adopted descriptive and causal comparative research design. Data analysis was done using the Statistical Package for Social Sciences (SPSS) -20 version. The results indicated that among the bank-specific factors non-performing loan ratio is found a significant but negative impact on liquidity. With respect to macroeconomic factors, the results indicated that gross domestic products (GDP) is found a significant positive effect on liquidity (liquid asset to total assets ratio) in the model. Similarly, in the second model there is negative but significant result found between profitability (return on equity) and liquidity (credit to deposit ratio). The study recommended that bankers should consider nonperforming loan and GDP in such a way that improves banks' performance. Finally, the current study provides useful insights for bankers, analysts, regulators, investors, and other interested parties on the liquidity in Nepalese commercial banks context.

Key Words: Bank specific, macroeconomics, liquidity, return on equity, non-performing loan, size, gross domestic products and inflation.

Introduction

Global financial crisis began with the liquidity problems in some banks. Many banks with adequate capital levels also experienced difficulties because of their poor practices in liquidity management. The banking system came under severe stress, which necessitated Central Banks' action for liquidity support. There were no internationally agreed measures (standards) for liquidity management. Regulations of Basel I and Basel II were concentrated mainly on capital regulation. But regulating capital was not sufficient for the successful operation of the banks. The crisis taught another lesson that liquidity and solvency are deeply interrelated. Importance of robust liquidity risk management was felt necessary during the crisis. BCBS issued guidelines, "Basel III: International framework for liquidity risk measurement, standards and monitoring (December 2010). BCBS has established some principles for Sound Liquidity Risk Management and Supervision. In addition to the principles, Basel III introduced two ratios for liquidity monitoring and management in banks: Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) LCR is introduced to promote short-term resilience by requiring sufficient high-quality liquid assets to survive acute stress lasting for 30 calendar days. The

bank which maintains the ratio more than hundred percent during the short period of time is considered to be the sound bank in terms of short-term liquidity. Observation of both liquidity ratios begins from 2011. Basel III requires that the minimum standard for Liquidity coverage ratio should be initiated from January 2015. Similarly, Net Stable Funding Ratio should be initiated from 2018 (NRB, 2013).

Nepal Rastra Bank has developed its own liquidity-monitoring framework for the short-term liquidity monitoring of the banks. The ratio defined in the framework is very similar to the Liquidity Coverage Ratio (LC Ratio) of the Basel III. Effective implementation of the framework is necessary to cover this aspect. For the long term liquidity monitoring, mechanism to monitor Net Stable Funding Ratio (NSFR) has to be developed. Some liquidity indicators like; CRR (5 percent), SLR (12 percent), CCD Ratio (80 percent) and net liquid assets to total deposit ratio (20 percent) are already in place. All these requirements are mandatory. Moreover, the liquidity-monitoring framework, which is very similar to LC Ratio of Basel III, is under implementation process. All of the banks are maintaining NRB liquidity requirements at present. – Initiating new liquidity requirement as per Basel III will not be a very new and complex issue in the context of Nepal. However, some exercise is necessary to initiate the Net Stable Funding Ratio (NSFR) (NRB, 2013).

The study of Horne and Wachowicz, (2000) have explored that more liquidity creation for general public can cause higher risk because a maturity transformation risk can arise and cannot satisfy the claim of depositor's demand. Kiyotaki and Moore, (2008) have explained that large banks prefer low liquidity because in a situation of cash shortage central bank give advance to them. In contrary, Rauch et al., (2009) and Berger and Bouwman (2009) have explored that smaller banks are likely to be stress on intermediation process hence, they have smaller amount of liquidity. Munteanu (2012) has concluded that the lack of bank liquidity is caused by global crisis as well as all negative events. The lender of the last resorts supports to commercial banks regarding bank liquidity, even with such far-reaching support, many financial institutions were declared bankrupt even they were profitable due to liquidity mismanagement as in the case of Lehman Brothers in 2008.

In the Indian context, Singh and Sharma (2016) have investigated internal and external determinants that determined the Indian commercial banks' LQD. The study revealed that bank ownership impacts LQD of commercial banks. The study has suggested that all bank-specific factors except (cost of funding) and macroeconomic determinants except (unemployment) have a significant impact on commercial banks' LQD. Further, Almaqtari et al. (2018) have studied internal and external factors that influence of commercial banks' profitability in India. Sopan and Dutta (2018) have investigated the bank-specific factors and macroeconomic factors that influence the banks' LQD in India. Bank-specific determinants contain bank-size, deposit rate, profitability, asset quality, funding cost and the rate of capitalization in a bank. While the macroeconomics factors include GDP and inflation rate. The results indicated that among internal (bank-specific) determinants, the size, profitability level, funding cost, and the quality of assets negatively impact the LQD risk of Indian commercial banks. Whereas, the rate of deposits and the capitalization rate have a positive influence. Amongst the macroeconomic determinants, inflation rate and GDP growth rate have a positive and negative association with bank LQD respectively. Al-Homaidi et al., (2019) have indicated that among the bank-specific factors, bank size, capital adequacy ratio, deposits ratio, operation efficiency ratio, and return on assets ratio are found to have a significant positive impact on LQD, while assets quality ratio, assets management ratio, return on equity ratio, and net interest margin ratio are found to have a significant negative impact on LQD. With respect to macroeconomic factors, the results indicated that interest rate and exchange rate are found to have a significant effect on LQD.

In the context of Nepal Bhattarai (2016) has revealed that bank liquidity is positively related to capital adequacy ratio, operating expenses assets ratio and profitability. However, bank liquidity is negatively associated to credit deposit ratio and financial expenses credits ratio. The influence of deposits assets ratio on liquidity is ambiguous. Gautam (2016) has revealed that, bank size, capital adequacy and inflation rate have a positive impact on liquidity; while non-performing loans, profitability and GDP growth rate have negative impact on liquidity of Nepalese commercial banks. Capital adequacy, non-performing loan and profitability have statistically significant effect on the liquidly of Nepalese commercial banks whereas bank size, GDP growth rate and inflation rate have statistically insignificant impact on the liquidity of Nepalese commercial banks. However, the capital adequacy, non-performing loan, bank size, profitability, growth rate of GDP and inflation rate are the major determinants of liquidity of this industry.

Recently, liquidity has become a major issue in Nepalese context. Since, liquidity comes at a cost; a bank faces a trade-off between the safety of greater liquidity and the expense of obtaining it. As an attempt to maintain sufficient liquidity, some policies have been reformed by Nepalese commercial banks. The banks have focused on mergers to increase capital requirement and lessened the competition. However, the banks with adequate capital levels have experienced difficulties in maintaining proper level liquidity. It indicates that existing procedures for liquidity risk management are not adequate to meet unforeseen depositors' demand for cash. Thus, it has become necessary to identify and manage important factors affecting the liquidity of banks in Nepalese context. The present study aims to examine the determinants of liquidity of Nepalese commercial banks.

The study is organized in the following manner. Section 2 presents Methodological Aspect. Section 3 discusses the Data Presentation and Analysis. Section 4 explains Summary and conclusion.

Methodological Aspect

The study has used secondary sources of data to determinants of liquidity of Nepalese commercial bank. The secondary data have been taken from annual report of the respective commercial banks for the year 2011/12 to 2016/17. In the process, it has been empirically investigating both internal (bank-specific) and external (macroeconomic) determinants that affect the commercial banks liquidity in Nepal. The present study seeks to fill the existing gap by empirically analyzing bank specifics variables such as return on equity (ROE), non-performing loan ratio (NPL) and size (LnTA), and macroeconomic determinants such as economic activity (GDP), inflation rate (INF). The convenience sampling method was used in choosing the banks for the study. Moreover, due care is given to include banks such as: joint venture, domestic, best performer, average performer and comparatively week performer in the sample. The banks selected for the study are: Nabil Bank, Bank of Kathmandu, Machhapuchhre Bank, Sanima Bank Ltd and NIC ASIA Bank Ltd.

Data were sourced from the annual reports of the banks in the sample. The data include time-series and cross-sectional data, i.e. panel data set to estimate the determinants of liquidity of commercial banks in Nepal. This study has adopted descriptive and causal comparative research design. Data analysis was done using the Statistical Package for Social Sciences (SPSS) -20 version.

The Model

By adopting the prescribed econometric model, the impact of specific banking factors such as: return on equity (ROE), non-performing loan ratio (NPL) and size (LnTA), and macroeconomic factors such as gross domestic product (GDP), inflation rate (INF) on liquidity have been estimated with the following regression equations.

$$LIQ_{it} = \beta_0 + \beta_1\,ROE_{it} + \beta_2\,NPL_{it} + \beta_3\,LnTA_{it} + \beta_4\,GDP_t + \beta_5\,INF_t + e_{it} \ldots\ldots\ldots\ldots\text{(I)}$$
$$LTD_{it} = \beta_0 + \beta_1\,ROE_{it} + \beta_2\,NPL_{it} + \beta_3\,LnTA_{it} + \beta_4\,GDP_{it} + \beta_5\,INF_{it} + e_{it} \ldots\ldots\ldots \text{(II)}$$

Where:

LIQ_{it} = Liquidity (total liquid assets / total assets) of ith bank in year t

LTD_{it} = Liquidity (total loan/ total deposit) of ith bank in year t

ROE_{it} = Return on Equity (net profit after tax/ total shareholders' equity) of ith bank in year t

NPL_{it} = Non-performing loan (non-performing loan/ total loan) of ith bank in year t

$LnTA_{it}$ = Size (Natural Lograthium of Total Assets) of ith bank in year t

GDP_t = Gross Domestic Products at consumer Price for the year t

INF_t = Inflation at total price of products for the year t

β_0 = The intercept (constant)

β_1 to β_5, = The slope which represents the degree with which bank performance changes as the independent variable changes by one unit variable.

e_{it} = error component

Study Variables and Hypothesis

The selection of variables for this study was based on previous relevant studies. Moreover, this study has considered whether the use of the particular variable makes economic sense in Nepalese context and the availability of data. The selected study variables, their definition, basis of measurement and priori expected sign have been depicted in Table 1.

Table 1
Variables Definition, Measurement and Expected Sign

Variables	Description	Measurement	Expected Sign	Priori Study
LIQ_{it}	Liquidity	Total Liquid Assets / Total Assets)	N/A	
LTD_{it}	Liquidity	Total Loans / Total Deposits	N/A	
ROE_{it}	Return on Equity	Net Profit after Tax/ Total Shareholders' Equity	-	(+) Singh and Sharma, 2016; Roman and Sargu, 2015; Melese, 2015. (-) Mehdi and Abderrassoul (2014)
NPL_{it}	Non-performing Loan	Non-performing Loan/ Total Loan	-	(+) Vodova (2011) (-) McNulty, Akhigbe, and Verbrugge, 2001)
LnTA	Size	Natural Lograthium of Total Assets	+ , -	(+) Melese (2015), Mehdi and Abderrassoul (2014), Malik (2013) and Shaha, Khan, Shaha, and Tahir (2018). (-) Vodov (2011) and Singh and Sharma (2016)
GDP_{it}	Gross Domestic Products	Gross Domestic Products at consumer Price	+	(+) Sheefeni and Nyambe, 2016; Boadi et al., 2016; Mazreku ,Morina, Misiri, Spiteri, and Grima, (2019). (-)Vodova (2013), Vodova (2011), Sheefeni and Nyambe(2016), Mehdi and Abderrassoul (2014) and Singh and Sharma (2016)
INF_{it}	Inflation Rate	Inflation at total price of products	+	(+) Singh and Sharma, 2016; Vodova, 2013; Ahmad, 2017. (-) Mehdi and Abderrassoul (2014), Malik (2013) and Vodova (2011).

Source: Review Survey by Researcher (2019)

Data Presentation and Analysis
Descriptive Statistics
The descriptive statistics of dependent variables (liquid assets ratio and credit to dipositive ratio) and independent variables bank specifics variables such as return on equity (ROE), non-performing loan ratio (NPL) and size (LnTA), and macroeconomic variables such as economic activity (GDP), inflation rate (INF) of the study are shown in table 2. The average LIQ during the study period is observed 19.96 percent with minimum 6.82 percent and maximum 32.59 percent While the average LTD is 80.90 percent and minimum and maximum range from 64.43 percent to 89.03 percent. The ROE of selected bank varies from minimum of 5.72 percent to 32.78 percent with an average of 18.18 percent.

Table 2
Descriptive Statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
LIQ	6.82	32.59	19.9583	9.02851
LTD	64.43	89.03	80.8993	6.35951
ROE	5.72	32.78	18.1827	6.60131
NPL	.01	3.47	1.1414	1.03800
LnTA	18.22	25.44	23.8489	2.09441
GDP	.20	7.39	4.1083	2.28604
INF	1.00	9.00	5.9333	2.62131

Source: Annual report of sample banks and results are drawn from SPSS - 20.
The NPL has a minimum value of 0.01 percent and maximum 3.47 percent with a mean of 1.14 percent. The minimum GDP has 0.20 percent and maximum 7.39 percent with an average 3.47 percent. The average inflation rate has 5.93 percent at the study period.
Correlation Analysis
The Table 3 represents the person's correlation matrix for dependent variables and independent variables. The correlation between dependent and independent variable are less than 0.70. The results show that there absent of multicollinearity. Thus, there is no evidence of presence of multicollinearity among the independent variables. There is positive association between LIQ and LnTA, and GDP whereas negative results found between ROE, NPL and INF.

Table 3
Pearson's correlation matrix for liquidity and its predictors

Variables	LIQ	LTD	ROE	NPL	LnTA	GDP	INF
LIQ	1						
LTD	.126	1					
ROE	-.163	-.479**	1				
NPL	-.623**	-.344	.348	1			
LnTA	.121	-.184	.155	-.084	1		
GDP	.358	-.042	-.175	-.075	-.044	1	
INF	-.319	-.083	.002	.273	-.028	-.319	1

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
Source: Annual report of sample banks and results are drawn from SPSS - 20.
Similarly, there is negative results found between LTD and its predictors such as ROE, NPL, LnTA, GDP and INF.

Regression Analysis

The ordinary least square (OLS) regression of bank specific and macroeconomics variables on liquidity is presented on Table 4. The table indicates that beta coefficient are negative for non-performing loan and inflation rate. It reveals that higher the nonperforming loan lower would be the liquidity. The findings consistent with the finding of McNulty, Akhigbe, and Verbrugge, (2001) but the findings inconsistent with the findings of Vodova (2011). Similarly, the higher inflation rate lower would be the liquidity. This result is consistent with the findings of Mehdi and Abderrassoul (2014), Malik (2013) and Vodova (2011).

Table 4
Regression Result of Bank Specific (ROE, NPL, LnTA) and Macroeconomics Variables (GDP, INF) on Liquidity (LIQ)

$$LIQ_{it} = \beta_0 + \beta_1 \; ROE_{it} + \beta_2 \; NPL_{it} + \beta_3 \; LnTA_{it} + \beta_4 \; GDP_t + \beta_5 \; INF_t + e_{it}$$
……………………….(I)

Predictors	Unstandardized Coefficients				Collinearity Statistics	
	B	Std. Error	t	Sig.	Tolerance	VIF
(Constant)	12.639	15.969	.791	.436		
ROE	.131	.219	.596	.557	.803	1.245
NPL	-5.338	1.414	-3.775	.001	.782	1.279
LnTA	.290	.634	.457	.652	.954	1.048
GDP	1.249	.612	2.043	.052	.861	1.161
INF	-.170	.549	-.311	.759	.814	1.229
R Square: 0.504, Adjusted R Square:0.401, F: 4.881, F(Sig): 0.003, DW: 1.176						

Source: Annual report of sample banks and results are drawn from SPSS - 20.

The beta coefficient of return on equity, size and gross domestic products are positive with liquidity. It shows that if return on equity, size and gross domestic products increases liquidity also would be increases. The results consistent for return on equity with the study of Singh and Sharma, (2016); Roman and Sargu, (2015); Melese (2015). The Study findings inconsistent with the study of Mehdi and Abderrassoul (2014). The findings consistent for size with the study of Melese (2015), Mehdi and Abderrassoul (2014), Malik (2013) and Shaha, Khan, Shaha, and Tahir (2018). Likewise, the result of gross domestic product is consistent with the study of Sheefeni and Nyambe, 2016; Boadi et al., 2016; Mazreku ,Morina, Misiri, Spiteri, and Grima, (2019). The contradictory with the findings of Vodova (2013), Vodova (2011), Sheefeni and Nyambe(2016), Mehdi and Abderrassoul (2014) and Singh and Sharma (2016).

The regression of bank specific and macroeconomics variables on liquidity (LTD) has been presented on the table 5. The beta coefficient of all bank specific and macroeconomics variables are negative with the liquidity (LTD). The findings show that when the Bank Specific (ROE, NPL, LnTA) and Macroeconomics Variables (GDP, INF) decreases the liquidity would be increases.

Table 5

Regression Result of Bank Specific (ROE, NPL, LnTA) and Macroeconomics Variables (GDP, INF) on Liquidity (LTD)

$$LTD_{it} = \beta_0 + \beta_1\ ROE_{it} + \beta_2\ NPL_{it} + \beta_3\ LnTA_{it} + \beta_4\ GDP_{it} + \beta_5\ INF_{it} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots (II)$$

Predictors	Unstandardized Coefficients		t	Sig.	Collinearity Statistics	
	B	Std. Error			Tolerance	VIF
(Constant)	103.180	13.287	7.766	.000		
ROE	-.399	.183	-2.187	.039	.803	1.245
NPL	-1.233	1.177	-1.048	.305	.782	1.279
LnTA	-.443	.528	-.839	.410	.954	1.048
GDP	-.450	.509	-.885	.385	.861	1.161
INF	-.202	.457	-.443	.662	.814	1.229
R Square: 0.308, Adjusted R Square:0.164, F: 2.138, F(Sig): 0.095, DW: 1.099						

Source: Annual report of sample banks and results are drawn from SPSS - 20.

The result return on equity has negative but statistically significant with liquidity. The result revealed that when profitability decreases the liquidity would be increases. The findings as per priory hypothesis.

Summary and Conclusion

Liquidity has become a major issue in Nepalese context. Since, liquidity comes at a cost; a bank faces a trade-off between the safety of greater liquidity and the expense of obtaining it. As an attempt to maintain sufficient liquidity, some policies have been reformed by Nepalese commercial banks. The banks have focused on mergers to increase capital requirement and lessened the competition. However, the banks with adequate capital levels have experienced difficulties in maintaining proper level liquidity. It indicates that existing procedures for liquidity risk management are not adequate to meet unforeseen depositors' demand for cash. Thus, it has become necessary to identify and manage important factors affecting the liquidity of banks in Nepalese context. The present study aims to examine the determinants of liquidity of Nepalese commercial banks. The review survey has been made nationally and internationally for the prior study. In the Nepalese context researcher has found the study such as Ojha (2015), Bhattarai (2016) and Gautam (2016). The study will be fulfilled the exiting gap of Nepalese cases. The study has applied ordinary least square (OLS) regression models to a panel data of commercial banks for the period from 2011/12 to 2016/17. The banks liquidity (liquid asset to total asset and total credit to total loan ratios) was taken as a dependent variable which functioned against both bank-specific and macroeconomic determinants. The present study seeks to fill the existing gap by empirically analyzing bank specifics variables such as return on equity (ROE), non-performing loan ratio (NPL) and size (LnTA), and macroeconomic determinants such as economic activity (GDP), inflation rate (INF). The convenience sampling method was used in choosing the banks for the study. This study has adopted descriptive and causal comparative research design. Data analysis was done using the Statistical Package for Social Sciences (SPSS) -20 version. The results indicated that among the bank-specific factors non-performing loan ratio is found a significant but negative impact on liquidity. With respect to macroeconomic factors, the results indicated that gross domestic products (GDP) is found a significant positive effect on liquidity (liquid asset to total assets ratio) in the model. Similarly, in the second model there is negative but significant result found

between profitability (return on equity) and liquidity (credit to deposit ratio). The study concluded that non-performing loan and gross domestics products has the major factor to explained the liquidity in Nepalese commercial sample banks cases. The study recommended that bankers should consider nonperforming loan and GDP in such a way that improves banks' performance. Finally, the current study provides useful insights for bankers, analysts, regulators, investors, and other interested parties on the liquidity in Nepalese commercial banks context.

References

Al-Homaidi, E. A., Tabash, M. I., Farhan, N. H. S., & Almaqtari, F. A. (2018). Bank-specific and macroeconomic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics & Finance, 6*(1), 1–26. doi:10.1080/23322039.2018.1548072

Almaqtari, F. A., Al-Homaidi, E. A., Tabash, M. I., & Farhan, N. H. (2019). The determinants of liquidity of Indian listed commercial banks: A panel data approach. *International Journal of Finance & Economics,* 1–18. doi:10.1002/ijfe.1655

Bank for International Settlements Basel Committee on Banking Supervision. (2012). *A framework for dealing with domestic systemically important banks. Bank for International Settlements.*

Bank for International Settlements Basel Committee. (2010b). *Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring*.

Basel Committee on Banking Supervision. (2010a). Basel III: A global Regulatory Framework for More Resilient Banks and Banking Systems.

Basel Committee on Banking Supervision. (2012). *Progress report on Basel III implementation. Bank for International Settlements.*

Basel III (2010). *International framework for liquidity risk measurement, standards and monitory*, Switzerland: Bank for International Settlements.

Belaid, F., Bellouma, M. & Omri, A. (2016). Determinants of liquidity risk: Evidence from Tunisian banks. *International Journal of Emerging Research in Management & Technology, 5*(6), 95-104.

Berger, A. N., & Bouwman, C. H. (2007). Bank liquidity creation

Berger, A. N., & Bouwman, C. H. (2009). Bank liquidity creation. Review of Financial Studies, 22(9), 3779-3837

Bhattarai, Y.R. (2016). Determinants of liquidity of Nepalese commercial banks. *KMC Journal, 8*(8), 18-36

Boadi, E.K., Li, Y. & Lartey, V.C. (2016). Determinants of liquidity of rural and community banks in Ghana. *British Journal of Economics, Management & Trade, 12*(3), 1-15.

Bunda, I. & Desquilbet, J. (2008). The bank liquidity smile across exchange rate regimes. *International Economic Journal*, 22(3), 361-386.

Chagwiza, W. (2011). Zimbabwean commercial banks liquidity and its determinants. *International Journal of Empirical Finance, 2*(2), 52-64.

Choon, L.K, Hooi, L.Y, Murthi, L, Yi, T.S, & Shven, T.Y. (2013). The determinants influencing liquidity of Malaysia commercial banks, and its implication for relevant bodies: evidence from 15 Malaysian commercial banks. http://eprints.utar.edu.my.

Dietrich, A., Hess, K. & Wanzenried, G. (2014). The good and bad news about the new liquidity rules of Basel III in Western European countries. *Journal of Banking and Finance*, *44*, 13-25.

Dogan, M. (2013). Comparison of financial performance of domestic and foreign banks: The case of Turkey. *International Journal of Business and Social Sciences, 4*(2), 233-240.

Fekadu, A. (2016). *Determinants of liquidity of commercial banks of Ethiopia (*Unpublished master's thesis). Addis Ababa University, Ethiopia.

Gautam, R. (2016). The determinants of banks liquidity: Empirical evidence on Nepalese commercial banks. THE BATUK: Journal of Interdisciplinary Studies, 2(2), 69-78.

Gujarat, D.N. (2004). *Basic econometric, (*4th edn.). USA: McGraw-Hill.

Kyle, A.S. (1985). Continuous auctions and insider trading. *Econometrica*, *53*, 1315-1335.

Lastuvkova, J. (2016). Liquidity determinants of the selected banking sectors and their size groups. *Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis, 64*(3), 971-978.

Lei, A.C.H. & Song, Z. (2013). Liquidity creation and bank capital structure in China. *Global Financial Journal, 24*, 188-202.

Malik, M.F. & Rafique, A. (2013). Commercial banks liquidity in Pakistan: Firm specific and macroeconomic factors. *The Romanian Economic Journal, 16*(48), 139-154.

Melese, N. & Laximikantham (2015). Determinants of banks liquidity: Empirical evidence on Ethiopian commercial banks. *Journal of Economics and Sustainable Development, 6*(15), 36-46.

Moussa, M.A.B. (2015).The determinants of bank liquidity: Case of Tunisia. *International Journal of Economies and Financial Issues, 5*(1), 249-259.

Munteanu, I. (2012). Bank liquidity and its determinants in Romania. Procedia Economics and Finance, 3, 993-998.

Nepal Rastra Bank (2013). *A study on Basel III and Nepalese banking: An assessment of capital regulation in Nepal,* Kathmandu, Nepal.

Rauch, C., Steffen, F., Hackethal, A., & Tyrrel, M. (2010). Saving Banks, Liquidity Creation and Mone-tary Policy. Available on: http://www.wiwi.uni-frankfurt.de/fileadmin/user.

Rauch, C., Steffen, S., Hackethal, A. & Tyrell, M. (2008). Determinants of bank liquidity creation: Evidence from savings banks. *Working Paper*: Germen.

Rauch, C., Steffen, S., Hackethal, A., & Tyrell, M. (2009). Savings Banks, Liquidity Creation and Monetary Policy. *Working Paper Series*.

Shen, C., Chen, Y., Kao, L., & Yeh, C. (2010). Bank liquidity risk and performance. *International Monetary Fund, Working Paper*.

Singh, A., & Sharma, A. K. (2016). An empirical analysis of macroeconomic and bank-specific factors affecting liquidity of Indian banks. Future Business Journal, 2 (1), 40–53. doi:10.1016/j.fbj.2016.01.001

Sopan, J., & Dutta, A. (2018). Determinants of liquidity risk in Indian banks: A panel data analysis. Asian Journal of Research in Banking and Finance, 8(6), 47–59. doi:10.5958/2249-7323.2018.00043.3

Subedi, S. & Neupane, B. (2011). *Determinants of banks' liquidity and their impact on financial performance* (Unpublished MBA thesis). Ace Institute of Management, Pokhara University, Pokhara.

Tseganesh, T. (2012). *Determinant of banks liquidity and their impact on financial performance: Empirical study on commercial banks in Ethiopia* (Unpublished MSc Thesis). Addis Ababa University, Ethiopia.

Valla, N, & Saes-Escorbiac, B. (2006). Bank liquidity and financial stability. *Banque de France Financial Stability Review*, 89-104.

Vodová, P. (2011). Liquidity of Czech commercial banks and its determinants. International Journal of Mathematical Models and Methods in Applied Sciences, 6, 160-188.

Vodova, P. (2012). Liquidity of slovak commercial banks and its determinants. *Proceedings of the 13th International Conference on Finance and Banking*, Karvina, Silesian University, 487-494.

Vodova, P. (2013). Determinants of commercial bank's liquidity in Hungary. *Financial Internet Quarterly e-Finance, 9*(3), 64-71.

Vtyurina, R., Bonner, C. & Lely, I.V. (2012). Determinants of banks liquidity buffers in central America. *Working Paper.*