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THE IMPACT OF LIQUIDITY RISK ON THE FINANCIAL PERFORMANCE OF LICENSED COMMERCIAL BANKS IN SRI LANKA

S L G M M Samarasinghe

W A I Lakmal

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Abstract

The importance of liquidity risk management prompted the global financial crisis in 2007 as it highlighted the significance of ensuring adequate liquidity to withstand adverse issues in the financial system. The funding pressures in 2007, underlined the deficiencies in the liquidity risk management practices in the financial system and thereby the Basel Committee introduced Basel accord III emphasizing the importance of liquidity risk management. As liquidity and profitability are prerequisite factors of the sustainability of the financial system, it is vital to analyze the impact of liquidity risk on financial performance. Thus, the main objective of this paper is to investigate the impact of liquidity risk factors and their significance on the performance of domestic Licensed Commercial Banks (LCBs) in Sri Lanka by analyzing data from twelve domestic LCBs from 2011-2021 using panel data regression analysis. The performance was measured using Return on Equity (ROE) and Return on Assets (ROA) where liquidity risk was measured using Non-Performing Loan Ratio (NPLR), Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Current Ratio (CR), Loan to Asset Ratio (LAR), Value of deposits (Deposits) & Liquidity Gap (LG). As per the findings, Deposits and NPLR had a negative significant impact while CAR had significant positive impact on bank performance. This study suggests that it is important to strengthen liquidity risk management to preserve the profitability of the banks in Sri Lanka and recommends that bank management need to take multiple actions such as creating a steady liquidity risk management framework, setting and reviewing risk limits regularly, implementing a strong Management Information System, conducting stress testing and creating and implementing a Contingency Funding Plan to mitigate liquidity risks.

Keywords: Liquidity Risk, Licenced Commercial Banks, Panel Data Analysis, Profitability, Return on Equity, Return on Assets, Sri Lanka

S L G M M Samarasinghe

(Corresponding Author)

Department of Banking & Finance, Wayamba University of Sri Lanka

Email: malmis@wyb.ac.lk

Tel: +94 763339242

 <https://orcid.org/0009-0001-9154-5684>

W A I Lakmal

Department of Banking & Finance, Wayamba University of Sri Lanka

Email: lakmalwai@wyb.ac.lk



1. INTRODUCTION

A healthy economy depends on a healthy financial system. Financial system stability means a safe and secure financial system which is able to withstand external and internal shocks. A stable financial system creates a favourable environment for depositors and investors, encourages financial institutions and markets to function effectively and efficiently, and hence, promotes investment and economic growth. Financial system stability requires a stable financial and economic environment within an impactful regulatory framework and a safe and robust payment and settlement system. The maintenance of financial system stability entails identifying and addressing potential vulnerabilities and risks to the financial system.

Banks play a critical role within the Sri Lankan financial system, as they are engaged in provision of liquidity to the entire economy, while transforming the risk characteristics of assets. Banks are also engaged in providing payment services, thereby facilitating all entities to carry out their financial transactions. On the other hand, banks can create vulnerabilities of systemic nature, partly due to a mismatch in maturity of assets and liabilities and their interconnectedness. Therefore, the soundness of banks is important, as it contributes towards maintaining confidence in the financial system, and any failure may have the potential to impact on activities of all other financial and non-financial entities, and finally the economy. No doubt the roles of banks in any economy are numerous and every economic activity revolves around credit or money (Adeniyi et al, 2021).

In the Sri Lankan context, the Central Bank of Sri Lanka (CBSL) regulates all the banks and other financial institutions in Sri Lanka under the Banking Act No. 02 of 2005. Banks play a central role in providing liquidity and maintaining the payment system. The Sri Lankan banking system consists of 24 Licensed Commercial Banks (LCBs) and 06 Licensed Specialised Banks (LSBs) and continue dominating the financial sector of the economy accounting for nearly 62% of the total asset base at the end of 2022 (CBSL,2022). LCBs are considered as the single most important category of financial institutions in the banking sector as they dominate with asset base of nearly 55% as of 2022 (CBSL,2022). Thus, these statistics depicts the vital role played by the commercial banks in the economy through facilitating payments and settlements, matching savers and borrowers and conducting multiple roles simultaneously.

However, when conducting these multiple roles in the economy banks are generally exposed to several types of risks, such as credit risk, operational risk, liquidity risk, market risk, legal risk, technological risk etc. Out of these multiple risks, liquidity risk is considered as the second largest risk faced by banks according to the CBSL as of 2023 (CBSL, 2023). Bank's liquidity can be defined as the bank's ability to meet expected and unexpected cash flows and collateral needs efficiently without creating adverse effects for daily operations or the financial condition of the bank. The liquidity of a bank exists in the assets that can be convertible to cash, net operating cash flows and ability to acquire funding through deposits, borrowings and capital

injections (Comptroller, 2023). The basic business model of a bank is matching short term funds with long term assets by creating a negative maturity gap of assets and liabilities. This negative maturity gap leads towards creating liquidity risk for the bank if they become unable to raise sufficient funds from the banks or from the market. Thus, the liquidity risk can be identified as the inability of a bank to meet its liabilities/ obligations as they become due (Dayananda, 2017). The obligations of the banks and its funding sources used to meet them depends mainly on the business mix, balance sheet structure and the cash flow profiles of on and off balance sheet obligations. There are multiple bank specific factors and external factors that can impact liquidity risk. In terms of bank specific factors, decline in asset quality, events such as accounting scandals, adverse consumer or market events that affect public reputation, decline in earnings performance, downgrading in credit rating and breakdowns in internal systems can impact liquidity risks. On the other hand, in terms of external factors, decline in local economic conditions, drastic changes in national or global economic conditions, financial scandals, disturbances to payment and settlement systems and natural disasters can create liquidity risks (Comptroller, 2023).

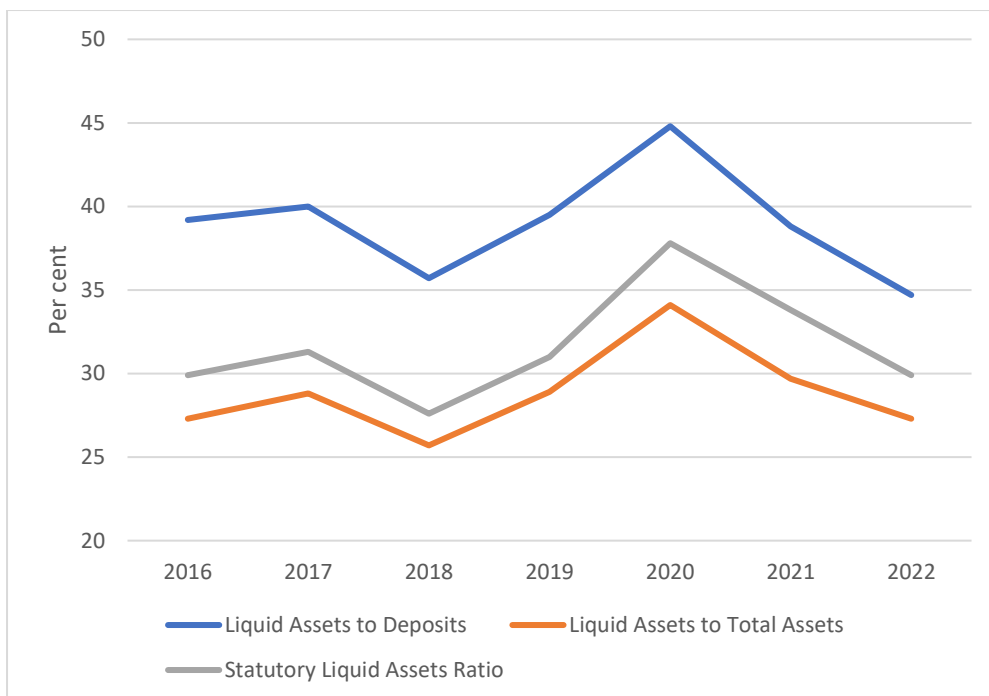
Liquidity risks faced by banks can be categorized as funding liquidity risk and market liquidity risk. Where funding liquidity refers to the level of liquidity where the bank is able to meet all the present and future cash flows, expected and unexpected without any material impact for the daily operations or the overall financial condition. This funding liquidity is mainly decided by the holdings of cash and other liquid assets, funding structure and the amount and type of contingent liabilities. On the other hand, market liquidity refers to the ability of the participating banks to exchange financial assets without any material effects on prices (Dayananda, 2017).

Liquidity risk can adversely affect both bank's earnings and the capital. Therefore, it becomes the top priority of a bank's management to ensure that sufficient amounts of funds are available to meet the demands of depositors and borrowers of the bank (Arif & Anees, 2012). The importance in liquidity risk management is that it can even lead to insolvency and bank runs if there is a sudden rise in demand of borrowers (Oldfield & Santomero, 1997). In addition, liquidity risk affects both the performance as well as the reputation of the bank, as the bank may lose confidence of the depositors if funds are not provided to them timely (Jenkinson, 2008). Further, liquidity risk may cause penalties from the regulators (Arif & Anees, 2012). Consequently, minimizing the liquidity risk is one of the most important aspects of asset and liability management of banks (Maduwanthi and Morawakage, 2019).

The banking sector in Sri Lanka is governed by the CBSL regulations and required to maintain a minimum amount of liquidity ratios to avoid any liquidity risks in the banking system. Statutory Liquidity Asset Ratio (SLAR), the banks operating in Sri Lanka should maintain a minimum amount of 20% of statutory liquidity assets, where the bank should measure the statutory liquidity assets according to Section 86 of the Banking Act, No 30 of 1998. If a bank fails to maintain the minimum SLAR, it would result in a cash penalty for the bank. Another important ratio is Liquidity Coverage

Ratio (LCR), which was imposed by the CBSL in accordance with “Basel III: International Framework for Liquidity Risk Measurement, Standards and Monitoring” (Dayananda, 2017). As per King and Tarbert (2011), under Basel I and Basel II, much attention was given to improve the capital requirements of internationally active banks. However, with the global financial crisis in 2008, the importance of maintaining sufficient liquidity levels was realized as the financial crisis was not so much of a capital crisis but rather a liquidity crisis. During the financial crisis, many banks and financial institutions found it difficult to convert their assets into cash and were forced to make use of central bank lending facilities. Ultimately, decline in liquidity led towards erosions in capital levels. Thereby, the Basel Committee on Banking Supervision (BCBS) published the Principles for Sound Liquidity Risk Management and Supervision in 2008 and introduced the LCR and Net Stable Funding ratio (NSFR). LCR is considered as the stock of high quality liquid assets which can be converted easily and immediately into cash in the secondary market to meet the liquidity needs of a bank for a period of 30 days when there is liquidity stress scenario (CBSL, 2022). All the banks are required to meet LCR at 100% from 1st of January 2019 onwards. In addition, the CBSL introduced NSFR, in 2019 which requires banks to maintain sufficient amounts of stable funding sources (CBSL, 2022).

In terms of the banking sector in Sri Lanka, banks faced a critical pressure on liquidity during 2022. Although the banking sector was able to maintain SLAR above the minimum requirement of 20%, it could be observed that it declined steeply from 44.8% in 2020 to 29.9% in 2022. In 2022, certain domestic banks depended heavily on the standing facilities provided by the CBSL for their day today liquidity requirements (CBSL, 2022). The LCR of the banking sector stood 237.5% and 191.2% by the end of 2022, which was well above the minimum requirement of 90% (CBSL, 2022). On the other hand, the NSFR introduced in 2019 stood at 140.8% at the end of 2022 well above the regulatory requirement of 90% (CBSL, 2022). However, despite the banks meeting the minimum liquidity requirements, there was a high widening of the maturity gaps which increased the liquidity risk.



Source: Central Bank of Sri Lanka

Figure 1: Liquidity Ratios of the Banking Sector

The attention towards liquidity risk in the banking sector aroused as a consequence of the US subprime crisis erupted in 2007, severely impacted the global financial markets and the US economy. At this point, BCBS indicated that liquidity was one of the root causes of the crisis and indicated that banks that heavily rely on short term money market to finance their asset operations suffered more from a shortage of liquidity. For instance, the Northern Rock one of the largest British mortgage lenders experienced severe liquidity crisis during the financial crisis period (Chen et.al,2018). Similarly, there were deficiencies in bank liquidity management in Europe which led towards the 2008 global financial crisis and 2010-2012 sovereign debt crisis. Aftermath the crisis, Basel III accords introduced new liquidity requirements which mandates banks to hold sufficient liquidity to absorb external shocks and hold stable funds to perform their daily lending activities even during critical situations (Distinguin et.al,2023). On the other hand, there are multiple occurrences in the Sri Lankan financial sector where banks and non-banking financial institutions such as Pramuka Bank, Seylan Bank, Edirisinghe Trust Investments (ETI) which were liquidated due to bankruptcy (Wijenayaka & Amarasinghe,2022). These companies faced severe liquidity issues and they failed to pay their depositors and ultimately ended up in liquidation. With these global and local incidents, the necessity for proper liquidity management aroused and resultantly the CBSL introduced the LCR and NSFR ratios mentioned in the Basel III to the local banks. Thus, it become important to analyze how liquidity risk impact on profitability of the banking sector.

Therefore, this study will mainly focus on investigating the impact of liquidity risk on profitability of the commercial banks in Sri Lanka. Accordingly, the study will be conducted with the objectives of identifying the significant liquidity risk factors which affect bank profitability and identifying the impact of liquidity risk factors on bank profitability. This research will contribute towards the literature of bank risk management as the number of studies conducted to analyse liquidity risk is minimum in the Sri Lankan context. Thus, this paper helps in understanding the significant factors of liquidity risk and their impact on the profitability of the banking system. The findings of this research will further support bankers and shareholders of the financial institutions to take efficient risk management decisions and forecast risks that will occur in the future and mitigate them.

2. LITERATURE REVIEW

2.1. Theoretical Review

Douglas Diamond and Phillip Dybvig introduced the Diamond-Dybvig Model in 1983, which highlights the role played by liquidity and the potential for bank runs due to depositors' fear for bankruptcy. This model demonstrates the fundamental mismatch between liquid liabilities of a bank and illiquid assets and promotes deposit insurance and other forms of government intervention as solutions to maintain stability (Diamond & Dybvig, 1983). This paper can be considered as one of the most influential articles on bank liquidity management and occurrence of bank runs (Teemu, 2023). The insights gained from this theory is highly relevant and has driven the development of new theories as well as criticisms towards banking models.

2.2. Empirical Evidence

By definition liquidity risk of a bank refers to the risk that a bank's financial condition or overall safety is adversely affected by the inability of the bank to meet its obligations. The business mix, balance sheet structure and cash flows play an important role in determining the ability of the bank to meet its obligations. When managing cash flows, banks encounter various situations that give rise to liquidity risk such as funding mismatches, market constraints to convert assets into cash and contingent liquidity events. And other risks such as operational, market, legal, reputational risks can also affect liquidity risks. Thus, liquidity risk management should be fully integrated to the risk management process of banks (Comptroller, 2023).

Past literature reveals that there are both positive and negative relationships and mixed results between liquidity and profitability of the banks. Many researchers have used bottom line performance indicators to gauge profitability and liquidity ratios to measure liquidity risks. Hakimi & Zaghdoudi (2017) studied the effect of liquidity risk on the Tunisian bank performance. The results showed that liquidity risk decreases significantly Tunisian bank performance. Similarly, Shen et al, (2009) studied the relationship between liquidity risk measures and bank profitability using a panel dataset of 12 advanced economies commercial banks over the period 1994-

2006 and found out that liquidity risk may lower bank profitability (ROA and ROE). In addition, Arif and Anees (2012), found a negative relationship between profitability and liquidity in their study about Pakistani banks.

On the other hand, Azzam & Almaleeh (2022) examined the effect of liquidity risk on performance measures (e.g., return on equity, return on assets, and earnings per share) of banks listed in Egyptian Stock Exchange throughout the period 2009-2019. The results revealed that deposits to liabilities ratio is significantly associated with return on equity (ROE), cash to assets ratio is positively and significantly associated with return on assets (ROA), and liquid assets to deposits ratio is correlated with bank performance measures. Similarly, the results obtained from the research of Ajayi & Lawal (2021), proved that there is a significant and positive relationship between liquidity management and profitability of banks in Nigeria. However, there are some researchers such as Khalid, Rashed & Hossain (2019) who studied the relationship between liquidity and financial performance of commercial banks in developing countries like Bangladesh and showed that liquidity has no significant and positive or negative impact ROA or ROE as financial performance indicators.

In the Sri Lankan context, Wijenayaka & Amarasinghe (2022) investigated the impact of liquidity risk on the bank profitability of commercial banks in Sri Lanka, considering the sample period from 2009 to 2018. Liquidity risk was measured by using the current ratio, capital adequacy ratio, liquid assets to total assets ratio, equity to total assets ratio and the number of deposits while bank profitability was measured by using ROA. In this study, it was found that, current ratio and the number of deposits have a significant impact on bank profitability. Where, the current ratio showed a positive relationship and number of deposits have a negative relationship with profitability. Thus there were mixed results between bank profitability and liquidity. In the study conducted by Maduwanthi and Morawakage (2019), the multiple regression analysis revealed that liquidity risk negatively and significantly affects bottom lines ROA and ROE, while positively affecting the top line Net Interest Margin (NIM) of the commercial banks.

3. RESEARCH METHODOLOGY

This is a quantitative research based on twelve LCBs selected based on the availability of data in the annual reports for the period 2011-2021. Variables employed for the study include measures for liquidity risk and financial performance. Liquidity risk was measured using Loan to Deposit Ratio (LDR), Current Ratio (CR), Loan to Asset Ratio (LAR), Liquidity Gap (LG), Capital Adequacy Ratio (CAR), Non- Performing Loans Ratio (NPLR) and the Value of Deposits (Deposits). Financial performance was measured using ROE and ROA which are commonly used accounting measures to measure the performance. These variables were selected from similar empirical research conducted to measure liquidity and profitability (Wijenayaka & Amarasinghe,2022; Mauduwanthi & Morawakage,2019; Arif and Anees ,2012).

The researcher has used Econometrics Views software to run the panel data regression. Unit Root test was conducted to test the stationarity of data. Panel regression was conducted to investigate the significant impact of liquidity risk factors on banks' performance where a Hausman test was conducted to select between fixed effect model and random effect model to conduct the regression analysis. Based on the Hausman test, random effect model was selected to conduct the regression analysis for ROA as the probability value of chi- square for ROA was greater than 5% significance level while fixed effects model was selected for ROE as the probability value of chi- square for ROE was lesser than 5% significance level.

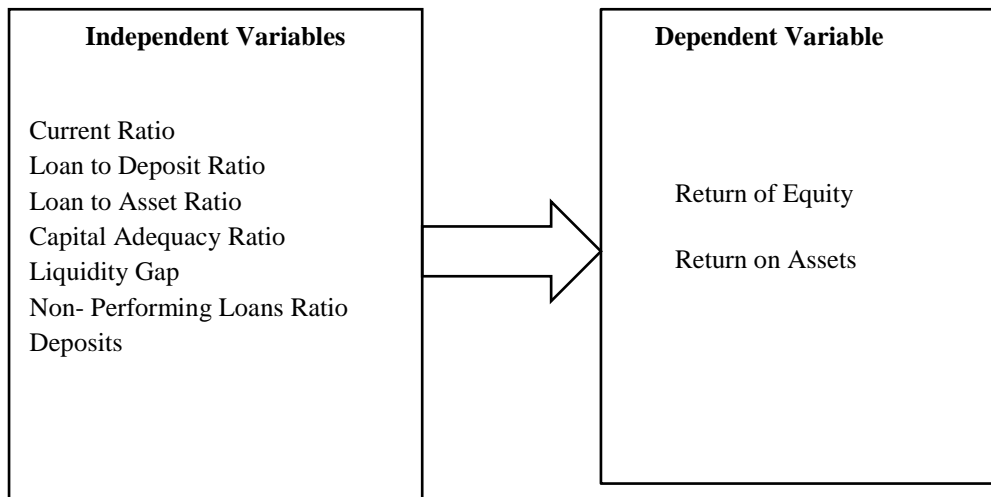


Figure 2: Conceptual Framework

The proposed dynamic models for the study are:

$$ROE = \beta_0 - \beta_1 CR + \beta_2 CAR + \beta_2 NPLR + \beta_3 LDR + \beta_4 LAR + \beta_5 LG + \beta_6 NPLR + \beta_7 Deposits + \varepsilon \quad (1)$$

$$ROA = \beta_0 - \beta_1 CR + \beta_2 CAR + \beta_2 NPLR + \beta_3 LDR + \beta_4 LAR + \beta_5 LG + \beta_6 NPLR + \beta_7 Deposits + \varepsilon \quad (2)$$

β_1 to β_7 = beta coefficient

ROE = Return on Equity

ROA = Return on Assets

CR = Current Ratio

CAR = Capital Adequacy Ratio

LDR= Loan to Deposit Ratio

LAR = Loan to Asset Ratio

LG= Liquidity Gap

Deposits= Value of Total Deposits

NPLR= Non- Performing Loan Ratio

4. RESULTS

Descriptive statistics was used to provide a comprehensive idea about the data. Table 1 illustrates the descriptive statistics of liquidity risk factors and performance indicators of LCBs in Sri Lanka.

Table 1: Descriptive Statistics of Liquidity Risk

	LIQUIDITY					CURRENT			
	ROE	ROA	NPLR	_GAP	LDR	LAR	DEPOSITS	_RATIO	CAR
Mean	15.47	1.45	4.41	5.02E+10	96.15	0.682917	4.97E+11	1.18	15.42
Median	15.62	1.41	4.13	3.70E+10	91.00	0.700000	2.87E+11	1.10	15.00
Maximum	44.69	4.24	15.25	2.01E+11	156.00	1.000000	2.87E+12	2.50	40.90
Minimum	0.30	0.10	1.31	3.00E+09	60.00	0.500000	1.66E+10	0.40	11.07
Std. Dev.	7.49	0.62	2.09	4.34E+10	18.58	0.095543	5.51E+11	0.45	3.27

As per the descriptive statistics (table 01), the bank profitability indicators ROE and ROA show significantly positive values where the mean ROE is nearly 15% for the period 2011-2021 and relatively higher compared to ROA suggesting that the banks have higher financial leverage. The highest NPLR was recorded as 15.25% while the median NPLR of the industry was around 4.13% for the period 2011-2021 mainly due to the economic and social instabilities caused by the pandemic and the economic crisis. Due to the high uncertainties prevailing in the economy, LCBs had to maintain a higher median CAR of nearly 15.00% which is even above the government regulatory requirements. On the other hand, domestic LCBs maintain satisfactory levels of current ratios, but the mean loan to deposit ratio (96%) shows that 96% of the deposits are given as loans, indicating lower liquidity levels.

Table 2: Results of Panel Regression

Variables	ROE		ROA	
	Coefficient	P-value	Coefficient	P-value
Constant	20.04	0.00	0.74	0.25
CAR	0.21	0.22	0.04	0.01**
NPLR	-0.91	0.002***	-0.07	0.01**
LDR	0.01	0.88	0.006	0.11
Current ratio	-0.06	0.95	0.04	0.71
LAR	-0.04	0.99	-0.07	0.89
Liquidity Gap	-1.92	0.68	-8.21	0.87
Deposits	-6.43	0.10*	-5.54	0.19
R squared	0.72		0.52	
F - statistic	13.93		5.85	
Prob (F statistic)	0.00		0.00	

*, **, *** significance at levels of 10%, 5%, and 1%, respectively

Table 02 shows the summary of regression analysis. Coefficient of determination (R^2) is used to measure the goodness of fit of a model. Accordingly, 72% variation of ROE and 52% of the variations of ROA can be explained by the given variables in the models. And also, the probability level of F statistics explains the suitability of the overall model, in the above two models it can be observed that the p-values are less than 0.05 indicating that both the models are suitable. In terms of ROE, only NPLR and deposits have a significant impact while only CAR and NPLR have a significant impact on ROA. The results are consistent with Wejanakaya & Amarasinghe (2022), as the current ratio and ROA exhibited a positive relationship, however there is a negative relationship between current ratio and ROE suggesting that higher liquidity results in declining profits. Furthermore, there is a negative relationship between deposits and profitability which is similar to the finding of Wejanakaya & Amarasinghe (2022) and Arif and Anees (2012) indicating higher the amount of deposits lower the profitability position of the bank. Furthermore, the results are consistent with the findings of Arif and Anees (2012) as the liquidity gap and NPL ratio showed a negative relationship with bank performance. NPLs indicate credit risk which can convert into severe liquidity issues later whereas higher liquidity gaps indicate rising up of costs as banks have to borrow from repo markets at higher rates. Further, the results show that capital adequacy ratio impact bank profitability in a significant manner.

5. CONCLUSION

Liquidity risk can create adverse effects on bank's earnings and capital and ultimately lead towards run on banks. This is because when the banks do not have sufficient liquidity to meet the demands of the depositors, it will reduce the confidence of the depositors towards the bank and thereby the bank will be insolvent. And on the other hand, having too much liquid assets will reduce the bank's profitability as holding liquid assets impose an opportunity cost. Therefore, liquidity management is considered as one of the basic principles in bank management. Liquidity risk can be maintained by having sufficient cash reserves, raising deposits, decreasing liquidity gap and NPLs. Where adequate cash reserves decrease the dependence of the bank on the repo market and reduce the costs on overnight borrowings and to avoid fire sale risks which is known as market liquidity risk.

This research was conducted using panel data of 12 LCBs from 2011-2021 using multiple regression analysis. The study found out that, NPLR, CAR and Deposits have a significant impact on bank profitability whereas the other liquidity risk indicators such as LAR, LDR, current ratio, liquidity gap have not created any significant influence on bank profitability. NPLs strain a bank's liquidity position when borrowers default loan payments and thereby the bank will experience cash flow problems as they depend on these repayments to meet the obligations of the depositors. On the other hand, rising levels on NPLs have a direct adverse impact on bank profitability as it reduces interest income. Furthermore, rising levels of deposits cause the profitability to decline due to the trade-off between liquidity and profitability.

Therefore, it is imperative for the Board of Directors to formulate and establish a liquidity risk management framework which is aligned with the overall risk management strategy of the bank. Mostly, banks appoint an Asset and Liability Management Committee (ALCO) consisting of senior management including the Chief Executive Officer to manage liquidity risk. The ALCO needs to develop policies, strategies and practices to manage liquidity risk in accordance with the risk tolerance level of the bank. Thus, the ALCO and the Board of Directors need to take prompt measures and immediate remedial actions to avoid any adverse consequences of illiquidity. In terms of mitigating liquidity risk, financial institutions need to set and regularly review liquidity risk limits over a particular time horizon where adequate liquidity is maintained. Limits should be set for cumulative cash flow mismatches, for ratios such as LCR, NSFR and SLAR. Further, an important element in the liquidity risk management framework is the Management Information System (MIS) which provides the Board of directors and senior management with current information regarding the liquidity position of the institution. The MIS should be used to check compliance with policies, procedures and limits of the bank and compare current liquidity exposures with the set limits. Further, liquidity stress testing is another prominent risk mitigation mechanism. This considers the ability of a financial institution to meet obligations during periods of stress in the absence of funding such as economic downturn, withdrawal of savings deposits by a

considerable amount, drying up of market liquidity etc. Also, financial institutions need to have a Contingency Funding Plan (CFP) which address the strategy for handling liquidity crises. This can be considered as a backup plan designed to address unexpected shocks, events and risks in the economy. This CFP needs to be implemented when a specific risk occurs and it shows a series of actions to be taken to mitigate the impact of the event. Moreover, banks need to implement internal controls consisting of procedures, processes, reconciliations, reviews which provide reasonable assurance. The above mentioned liquidity risk mitigation methods provide reasonable assurance that the bank achieves liquidity risk management objectives (Comptroller, 2023).

In further research, researchers can use different measures of performance other than bottom line measures to study the impact of liquidity risk factors on profitability and can conduct their studies not only for LCBs but also to other non-banking financial institutions. There is a vital importance of assessing, monitoring and reviewing of the liquidity status of the institutions in the financial sector in Sri Lanka as number of them such as Bimputh Finance PLC, Edirisinghe Trust Investments, Central Investments and Finance Ltd, TKS Finance Ltd got their licenses either canceled or suspended due to lack of proper administration, resulting lack of confidence among the depositors towards the CBSL as well as the overall financial sector in Sri Lanka.

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