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Impact of Credit Risk on the Relationship between the Liquidity Risk and the Financial Performance in Islamic and Conventional Banks

Saba Iqbal*

National University of Modern Languages, Lahore, Pakistan

ABSTRACT

Background: Bank failures are caused by credit risk and liquidity risk. Banks need to paly crucial role in addressing these risks which cause fragility. This study looks into how liquidity risk affects banks' financial performance. It also finds the moderating impact of credit risk on the relationship between liquidity and financial performance.

Methodology: This study selects banks of Asia Pacific region from year 2017-2022 and the data is analyzed through two step system GMM analysis.

Results: The results indicate that liquidity risk is significantly and negatively moderates the financial performance of Islamic and conventional and the situation is even worse in the presence of credit risk.

Conclusion: The study's value lies in the fact that it tackles the most important categories of risks i.e., liquidity and credit risk that banks of Asia Pacific region in comparison of Islamic and conventional banks. Effective risk management techniques enable the banks to cater the liquidity and credit risk.

Keywords: Liquidity Risk, Credit Risk, Financial Performance, Islamic Banks, Conventional Banks.

Jel Classification: G21, G33, G38, G1.

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***Address of Correspondence:**
saba.iqbal@numl.edu.pk

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1. INTRODUCTION

Liquidity has become an essential measure of banks since the 2008 financial crisis as it enables them to meet their cash needs and obligations. Liquidity refers to the banks' ability to quickly turn their assets into cash without diminishing their value. Liquidity risk can have detrimental effects on banks' reputation, general operations, and financial stability (Sidhu *et al*., 2022). When a bank faces liquidity shortages and is unable to fulfill its obligations, it may be forced to sell assets at reduced prices or seek emergency financing, potentially resulting in losses and depleting its financial health. Although central banks and other financial institutions can provide short-term relief, such emergency funding often comes with higher interest rates and stringent terms, which can further reduce a bank's profitability. To address these challenges, policymakers have established

minimum liquidity requirements minimum liquidity requirement (Cakmak & Sunal, 2024) in line with Basel III regulation, introduced by the Basel III committee regulatory body. Regulatory frameworks were created on Banking Supervision to manage variety of risks. The three primary pillars of Basel II, which was put into effect in 2004, were supervisory review, market discipline, and minimum capital requirements. Its goals were to increase risk management, foster transparency, and strengthen the banking industry's capacity to handle financial strain. Basel III, was adopted in response to global financial crisis in 2008, expands on Basel II by enforcing more stringent capital requirements, establishing fresh guidelines for bank leverage and liquidity, and augmenting the general robustness of banks (Mdaghri & Oubdi, 2022).

Banking systems can be broadly categorized into Islamic and conventional banking. Islamic banks operate on the principles of Shariah. However, they are not free of risk that occur in financial institutions. Credit and liquidity risks affect the Islamic banks. Credit on the asset side while liquidity risk on the liability side causes the banks to become insolvent (Marthinsen & Gordon, 2024). Credit risk causes the liquidity risk if the banks have financed too much assets and they are not able to satisfy depositor's demand. Islamic banks face the liquidity risk differently to conventional counterparts. Islamic banks are limited in their ability to make money when there are few investment options. This consequently impacts their capacity to provide returns to depositors, who are basically partners in the bank's investment operation. There is limitation in the availability of money market instruments that comply with Shariah which presents challenges for Islamic banks. This might be problematic when there is a lack of liquidity since Islamic banks might find it harder to raise money fast without the use of traditional money market instruments (Syadali *et al*., 2023).

A bank may be reluctant or unable to provide credit to other banks, companies, or individuals when it is experiencing liquidity issues. As a result, lending may become more restrictive throughout the entire financial system, which could result in decreased economic activity and potential recessionary pressures (Salamaliki & Venetis, 2024). No matter how slight, a lack of liquidity can have unforeseeable effects on how a financial institution operates and interacts with its clients. Financial institutions need liquidity to pay for urgent cash requirements, including customer withdrawals, loan disbursements, and operational costs. Delays, defaults, and a decline in trust may result if they cannot fulfill the liquidity requirements. Liquidity has a profound impact on an organization's overall stability and financial performance. It supports effective operations, risk management, expansion potential, and confidence among investors. In order to maximize financial success, banks must find a balance between preserving adequate liquidity and efficiently using their available resources (Kinyua & Fredrick, 2022).

Banks play a crucial role in the economic development. Investor confidence, defined as the belief that investments in specific projects will produce favorable returns with manageable levels of risk, drives capital into various sectors such as infrastructure, manufacturing, and technology. When investors are optimistic about a country's economic future, they are more inclined to invest in these sectors (Eichenauer *et al*., 2021). Banks facilitate this process by providing funding for different projects, which, in turn, motivates businesses to expand and stimulates economic growth. Banks, in their role as fund providers, seek to earn interest on the capital they lend. However, there are circumstances where banks do not receive the expected interest payments or the principal amount back from borrowers. Such situations can severely disrupt the normal operations of the banking system, as banks effectively give away their money without earning any income if loans are not repaid (Natufe & Evbayiro-Osagie, 2023). This results in a direct loss of liquidity and capital, which affects its capacity to service existing debts and to extend loans to other customers. Liquidity issues can arise from late payments which are critical since banks rely on interest income to fund their operations and meet financial obligations. Without this income, banks may be forced to seek more expensive borrowing to meet their immediate liquidity needs (Abdelaziz *et al*., 2022). Over time, this can adversely affect the banks' financial performance and potentially lead to their failure. Consequently, credit risk has become a primary focus of risk

management in the banks globally, especially in the wake of 2008 financial crisis. The main reason for banks failure during these crisis included poor liquidity management, the dependence on short term money markets for financing, and the inability to recover loan payments from customers (Chen *et al*., 2018).

Although various financial institutions offer loans, the majority of clients seek loan from banks. This critical role demand that banks maintain sufficient liquidity to meet their clients' funding needs and support economic activities. Cash acts as safeguard against uncertainty and helps businesses challenges posed by imperfect markets. It provides businesses with financial flexibility, allowing them to expand opportunities and control risk, even when external financing options are limited or costly. However, the impact of this liquidity on the performance of banks, particularly in Asia Pacific region, remains unexplored.

The primary aim of this study is to explore that if Islamic and conventional banks maintain enough liquidity for their continued operations, does it promote or decrease their financial performance. Additionally, this research explores how credit risk influences the relationship between liquidity and financial performance in conventional and Islamic banks. Addressing these questions is essential for some reasons. First, empirical data analysis is necessary to understand how liquidity risk impacts bank performance—whether positively or negatively. Second, improved financial performance can enhance banks' lending capabilities. Furthermore, this study also explores the moderating impact of credit risk on the relationship between liquidity and financial performance. This empirical analysis of moderating impact of credit risk will give motivation to banks to manage their credit risk and get loans back from customers timely. This research has practical insights for policymakers to manage their liquidity efficiently.

Research Questions

1) What is the impact of Liquidity risk on the financial performance of Islamic and Conventional banks?

2) How the credit risk moderates the relationship between the impact of liquidity risk on the financial performance of Islamic and Conventional banks?

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Liquidity Risk and Financial Performance of Islamic and Conventional Banks

In many previous studies, liquidity risk shows a mix of positive and negative relation with performance of banks. In a previous study of sample of twenty five banks from Bangladesh on the different determinants of banks found a positive relationship between liquidity and the performance which was measured by net interest margin, ROA and ROE (Chowdhury *et al*., 2023a). However, a study revealed that liquidity has positive effect on bank profitability, but not considerably (Islam & Nishiyama, 2016). A research by Abdelaziz *et al*. (2022) analyzed the data of conventional banks of MENA countries, and identified negative relationship between profitability and liquidity as well as credit risk. Similarily, a study on European banks from 2001 to 2011 found that profitability of banks decrease with the increase in liquidity risk (Yulianti & Pakata, 2023). Conversely, a study of Cucinelli (2015) found that bank's chance of default is not related to liquidity risk.

Recent exploration of literature by Hamdi and Hakimi (2019) showed the relation of liquidity risk on profitability is not linear and changes up to certain threshold level. Their sample was very extensive and they divided the sample into high and low-income countries. After using the panel smooth transition regression, liquidity impact profitability differently between these two groups of companies.

Theory of Bank Liquidity developed by Calomiris *et al*. (2015) on the bank liquidity needs, demonstrates that banks must maintain sufficient assets to maintain the liquidity risk. According to this theory, where number of banks are prone to liquidity crisis, an interbank exchange can be formulated by imposing the cash requirements on the banks. Liquidity risk is indeed a major worry for banks (Galletta & Mazzù, 2019) reflecting the

probability that a bank will fail to meet its short-term obligations, including customer withdrawals, without incurring substantial losses (Effiong & Ejabu, 2020).

The amount of cash on hand declines if several customers withdraw large amounts of money (Kozlowski & Jordan-Wood, 2022). Consequently, the bank's profitability and overall financial well-being may be impacted by a reduction in its capacity to lend or invest (Chasha *et al*., 2022). Effective management of liquidity risk involves ensuring the bank has adequate liquid resources to meet its commitments, particularly during challenging or uncertain periods, which is a crucial aspect of responsible risk management in the banking sector (Hacini *et al*., 2021). Additionally, overdraft fees can adversely affects a bank's operations (Di Maggio *et al*., 2020).

Maturity transformation is a key aspect of banking operations, involving the mismatch between long-term assets and short-term liabilities. Banks typically hold long-term assets, such as investments and loans, but finance these with short-term obligations, such as short-term loans and customer deposits (Galletta & Mazzù, 2019).

Based on the above literature, our first hypothesis is

H1: *Liquidity is negatively related to the performance of Islamic and conventional banks.*

Moderating Impact of Credit Risk on Liquidity Risk and Performance of Banks

Multiple indicators have been used to measure credit risk in the literature, with the Non-Performing Loans (NPLs) ratio being the most widely accepted and standard indicator. Typically, debt is classified as non-performing if principal and interest payments are overdue by more than 90 days (Do *et al*., 2020). An increase in non-payments of credits results due to increase in non-performing loans, which lowers the profitability. The research on connection between bank profitability and credit risk reveals contradictory and inconsistent results. Negative connection between credit risk and financial performance is supported by Ekinci and Poyraz (2019). However, the positive connection between the credit risk and financial performance is proved by Flamini *et al*. (2009).

Banks are unique because of their capacity to effectively convert the financial claims of household savers into claims made by businesses, individuals, and governments. Their ability to handle, assess, and monitor information is crucial for the efficient and cost-effective transfer of financial claims between savers and borrowers. Monitoring these borrowers is very important because default of a single of the borrower can cause severe damage to the reputation of the entire banking industry (Winton & Yerramilli, 2021). For example, in 2002 at the time of bankruptcy of WorldCom, US banks faced $700 million losses (Jeter, 2004). Due to this single incident, J.P. Morgan Chase's earnings per share decreased by 5 cents, or almost 2 percent (Petra & Spieler, 2020). The recession of 2000 increased the nonperforming loans tremendously. Initially, small banks experienced more non-performing loans, but by the later part of the 2000s, larger banks also faced increased NPLs, indicating that larger banks might engage their funds in riskier portfolios (Ari *et al*., 2021). Thus, all types of banks encounter loan non-performance as a source of credit risk.

A study of Indonesian banks from 2007 to 2011 demonstrated that credit risk has a significant negative impact on financial performance, as measured by ROA and ROE (Ruziqa, 2013). Increasing non-performing loans can lead to higher loan loss provisions, which reduce the profitability of financial institutions (Ozili & Outa, 2017). Credit risk has been found to negatively affect return on assets of Indonesian banks listed on stock exchange from 2015-2017 (Ramadhanti & Hidayati, 2019). The combination of short-term obligations and long-term assets in banks creates maturity mismatch risk, which can lead to fund withdrawals and borrower defaults (Carré, 2019). This maturity mismatch causes liquidity risk on one hand, while unrecovered bad loans

exacerbate the liquidity crunch. Conversely, when banks have enough liquidity available, they want to give more and more loans to customer by relaxing the lending standards (Naqvi & Acharya, 2012). On the basis of this literature, out second hypothesis is

H2: *Credit risk moderates the relationship between liquidity risk and performance of Islamic and conventional banks.*

This research is supported by theory of financial intermediation, which explains how the financial intermediaries channels the funds between the borrower and creditor (Pyle, 1971). Financial intermediaries improve liquidity in the financial markets by providing liquid assets such as deposits, money market instruments, and other financial products. This liquidity is crucial for both borrowers and savers, as it allows for the access and withdrawal of funds as needed. Through fractional reserve banking, banks generate credit by lending almost all the cash they receive and essentially create loans, while retaining only a portion of deposits as reserves.

In view of above discussed literature, two hypotheses were developed and have been presented in Figure **1** as conceptual framework.

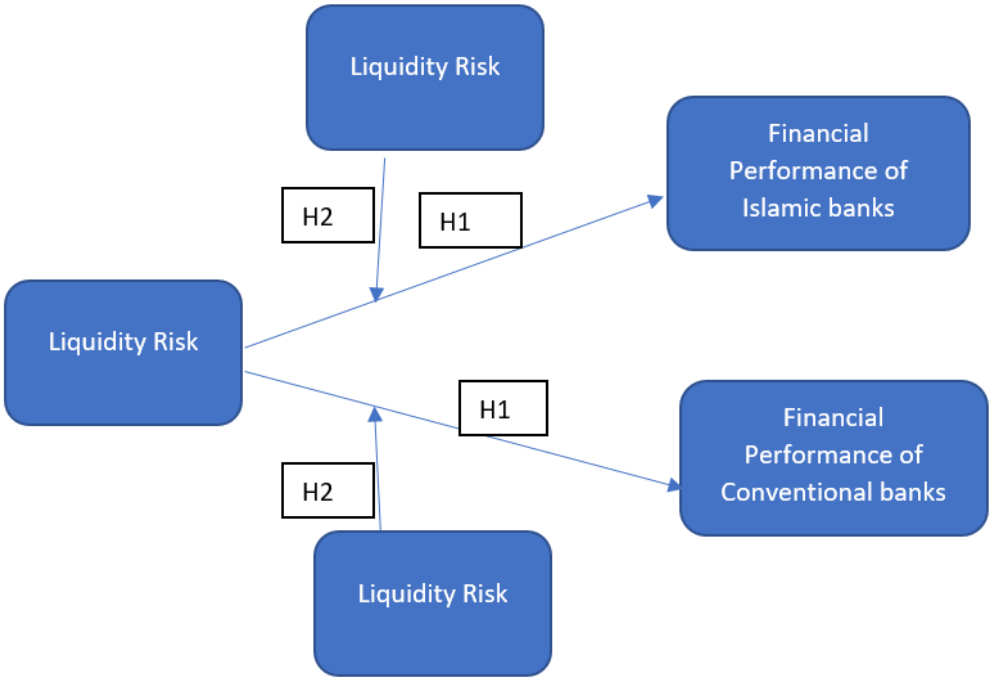

Figure 1. Conceptual Framework.

3. DATA AND METHODOLOGY

Sample and Selection of Data

Population of this study includes Islamic and Conventional banks while the sample is the Islamic and conventional banks of Asia pacific region. Based on THE ASIAN BANKER website's ranking of the strongest banks, 28 conventional banks and 17 Islamic banks were selected. Banks are selected on the basis of strongest GDP and those countries which have at least one Islamic bank or Islamic Finance group. The annual reports provided the data used in this study. Some of largest and fastest-growing economies in the world are found in

the Asia Pacific area. This market's importance to the global financial landscape makes it an intriguing subject to research in terms of liquidity and credit risk because it can shed light on the state of the international financial system. Seven countries are selected from Asia pacific region that includes South Korea, China, Malaysia, Pakistan, Bangladesh, Thailand and Indonesia. Five banks are selected from each country and data is collected from 2017 to 2022 from the annual reports of the banks.

Measurements

There are two dependent variables for the measurement of financial performance. One is return on assets (ROA) and the other is return on equity (ROE). These proxies of performance measurement have been used in many previous studies like Adusei (2022). Independent variables include the liquidity ratio which is calculated by Loan to deposit ratio. The value of this ratio is taken from the annual reports of the banks. Non-performing loan ratio is a proxy of credit risk. The moderator variable LIQ*NPL is obtained by multiplying the liquidity ratio with NPL ratio. Capital ratio, bank size and leverage are use as control variables. These control variables are used in many studies like Abubakar *et al*. (2023). Details of variables is provided in the Table **1**.

Details of Variables

Table 1. Variables of the Study.

Name	Variable	Nature
Return on asset	ROA	Dependent
Return on Equity	ROE	Dependent
Liquidity	LIQ	Independent
Liquidity*Non-performing loans	NPL*LIQ	Moderator
Capital Ratio	CR	Control
Bank Size	BS	Control
Leverage	LEV	Control

Methodology

On the basis of our hypotheses, we use the traditional econometric models for panel data to find the effect of liquidity on the performance of Islamic banks and moderating role of credit risk on the relationship between the liquidity and performance of Islamic and conventional banks.

Following are the estimation models both for Islamic and conventional banks:

$$ROA_{i,n}=\alpha+\beta1(LIQ)_{i,n}+\beta_2(CR)_{i,n}+\beta3NPL+\beta4(LEV)_{i,n}+\beta5(BS)_{i,n}+e$$

$$ROE_{i,n}=\alpha+\beta1(LIQ)_{i,n}+\beta_2(CR)_{i,n}+\beta3NPL+\beta4(LEV)_{i,n}+\beta5(BS)_{i,n}+e$$

$$ROA_{i,n}=\alpha+\beta1(NPL*LIQ)_{i,n}+\beta\ 2(NPL)+\beta\ 3(LIQ)+\beta4(CR)_{i,n}+\beta5(LEV)_{i,n}+\beta6(BS)_{i,n}+e$$

$$ROE_{i,n}=\alpha+\beta1(NPL*LIQ)_{i,n}+\beta\ 2(NPL)+\beta\ 3(LIQ)+\beta4(CR)_{i,n}+\beta5(LEV)_{i,n}+\beta6(BS)_{i,n}+e$$

Estimation Technique

Researchers employed the generalized methods of moments (GMM) proposed by Arellano and Bond (1991) as it guarantees effectiveness and consistency. GMM is an effective method for finding the parameters in dynamic panel data models. It uses instrumental variables to resolve endogeneity concerns, yields reliable and accurate estimates, and is robust against some statistical problems. When traditional methods may not be as successful for analyzing economic linkages, researchers frequently resort to GMM. The generalized method

of moments (GMM) approach is a dynamic technique that uses instruments that handle problems with simultaneous reverse causality, heteroskedasticity, endogeneity, measurement error, and unobserved individual variability. This research uses the two-step system GMM estimator rather than the one-step system GMM because it yields more asymptotic efficient findings, especially when the one-system GMM has significant heteroskedasticity problems (Berk *et al*., 2020).

4. RESULTS AND DISCUSSION

Descriptive Statistics

Table 2. Conventional Banks.

Variable	Mean	Standard Deviation	Min	Max
ROA	1.54	2.20	0.006	13
ROE	10.81	6.06	0.022	33.92
CR	15.15	5.85	.221	31.04
Bank Size	14.72	5.091	1.33	26.59
Liquidity	78.89	131.32	0.0025	599.38
Leverage	10.15	21.91	0.002	83.5
Liqnpl	234.39	802.78	0	9766.12
NPL	2.49	2.93	-.8	18.2

Note: *ROA is Return on asset, ROE is Return on Equity, CR is Capital Ratio, NPL is Non-Performing Loans and LIQ*NPL is moderator by multiply Liquidity and NPL.*

Table **2** shows descriptive statistics for the mean value and standard deviation of various variables for conventional banks. The ROA and ROE are the dependent variable. ROA is the internal operational results while ROE is market return. Mean value of ROA and ROE is 1.54 and 10.81 respectively. Both displayed the minimum values as 0.006 and 0.022 while maximum vales as 13 and 33.92. Capital ratio has mean value of 15.15 which shows that conventional banks in our sample are moderately capitalized. Bank size is averaged at 14.72. Liquidity and leverage have mean value of 78.89 and 10.15 respectively. LIQNPL which is a moderating variable has mean value of 234.39 and NPL has mean value of 2.49.

Table 3. Islamic Banks.

Variable	Mean	Standard Deviation	Min	Max
ROA	0.873	0.745	-3.51	1.8
ROE	5.609	24.914	-126.64	34.6
CR	14.650	6.579	-6.5	23.76
NPL	2.832	2.796	-0.8	12.11
Banksize	13.927	4.323	5.659	22.89
Liquidity	203.91	1121.5	0.01	8038
Leverage	3.946	10.197	0	52
Liqnpl	510.35	3308.71	-32.72	31750.1

Note: *ROA is Return on asset, ROE is Return on Equity, CR is Capital Ratio, NPL is Non-Performing Loans and LIQ*NPL is moderator by multiply Liquidity and NPL.*

Mean value and standard deviation of the variables for Islamic banks are displayed descriptively in Table **3**. The mean ROE and ROA values are 5.609 and 0.873, respectively. Both had maximum values of 34.6 and 1.8, and minimum values of -126.64 and -3.51. The average capital ratio in our sample of Islamic banks is 14.65, indicating a reasonable level of capitalization. The average bank size is 13.927. Leverage and liquidity have

typical values of 3.946 and 203.91, respectively. The moderating variable LIQNPL has a mean value of 510.35, while the mean of NPL is 2.832.

Correlation Matrix

Table 4. Correlation Matrix Conventional Banks.

Variable	ROA	ROE	CR	NPL	Bank Size	Liquidity	Leverage	LIQ*NPL
ROA	1	-	-	-	-	-	-	-
ROE	-0.0171	1	-	-	-	-	-	-
CR	0.137	0.5256	1	-	-	-	-	-
NPL	0.465	-0.3319	0.0267	1	-	-	-	-
Bank size	-0.46	0.1951	0.0082	-0.1098	1	-	-	-
Liquidity	-0.0086	0.1026	-0.022	-0.0389	0.0075	1	-	-
Leverage	-0.026	0.0876	-0.0273	0.0888	0.0537	0.3515	1	-
LIQ*NPL	0.1138	-0.1687	0.048	0.4827	0.0064	0.4159	0.0442	1

Note: *ROA denotes Return on asset, ROE denotes Return on Equity, CR denotes Capital Ratio, NPL denotes Non-Performing Loans and LIQ*NPL is moderator by multiply Liquidity and NPL*.

Table **4** shows the correlation between the variables of conventional banks. To do this, we have examined the type (positive or negative) and degree (strong or weak) of correlation using the Pearson correlation. The table shows that the level of correlation is not so strong between all the variables. The highest level of correlation is between LIQ*NPL and NPL. As first variable is an interaction term, a strong association between the two variables was what we anticipated. The utilization of GMM depicts that there is no issue of multicollinearity in the model.

Table 5. Correlation Matrix Islamic Banks.

Variable	ROA	ROE	CR	NPL	Banksize	Liquidity	Leverage	Liqnpl
ROA	1	-	-	-	-	-	-	-
ROE	0.7437	1	-	-	-	-	-	-
CR	0.6207	0.6013	1	-	-	-	-	-
NPL	0.0188	0.2092	0.1286	1	-	-	-	-
Banksize	0.1504	0.1496	0.2568	-0.0112	1	-	-	-
Liquidity	-0.0228	-0.0107	0.0199	-0.0217	-0.0937	1	-	-
Leverage	-0.1162	-0.2086	-0.0999	-0.0656	0.0288	-0.0466	1	-
Liqnpl	-0.0782	-0.0076	0.0265	0.0433	-0.0867	0.8881	-0.0442	1

Note: *ROA is Return on asset, ROE is Return on Equity, CR is Capital Ratio, NPL is Non-Performing Loans and LIQ*NPL is moderator by multiply Liquidity and NPL*.

Table **5** shows correlation between the variables of Islamic banks. For this, we have examined the type (positive or negative) and degree (strong or weak) of correlation using the Pearson correlation. Table shows that the level of correlation is not so strong between all the variables. The maximum correlation is between LIQ*NPL and liquidity. As first variable is an interaction, a strong association between the two variables is anticipated. Again, GMM shows that there is no issue of multicollinearity.

Impact of Liquidity Risk on the Performance of Conventional and Islamic Banks

Table 6. Liquidity Risk and Financial Performance of Conventional Banks.

Variable	ROA	ROE
Ll. (ROA/ROE)	0.964***	0.914***
Liquidity	-0.000188***	-0.00061***
CR	0.0026	0.094***
NPL	0.024***	-0.039
Bank Size	-0.038***	0.2086***
Leverage	0.0028***	0.001715
No of obs	140	140
No of Instruments	38	38
No of Banks	28	28
Hansen Test	0.935	0.944
AR2	0.175	0.549

*** significance at 1%.Liquidity is liquidity ratio of banks, CR is capital ratio, NPL is non-performing loans ratio, bank size is calculated by taking the log of total assets and leverage is the leverage ratio.

Table **6** shows the effect of liquidity risk on the financial performance of conventional banks in Asia Pacific region. GMM analysis results show liquidity risk is negatively and significantly related to the return on assets of the banks. The value of the coefficient is -0.00018 for ROA and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Bank Size, and Leverage is 0.0026, 0.024, -0.038 and 0.0028 respectively. All the coefficients are significant at 99% confidence interval. The value of Hansen test is 0.935 which shows the instruments are valid and uncorrelated with the error term. This indicates that overidentification issues are not present in the model. The value for AR2 is 0.175 which shows that the residuals do not exhibit significant second-order serial correlation, supporting the model's validity.

The GMM analysis results further show that liquidity risk has negative and significant impact on the return on equity. The value of coefficient is -0.00061 for ROE and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Bank Size and Leverage is 0.094, -0.039, 0.2086 and 0.001715 respectively. All the coefficients are significant at 99% confidence interval except NPL which is insignificant. The value of Hansen test is 0.944 which shows validity of instruments. This indicates issue of overidentification is not present in the model. The value for AR2 is 0.549 which shows that the residuals do not exhibit significant second-order serial correlation, supporting the model's validity.

Table 7. Liquidity Risk and Financial Performance of Islamic Banks.

Variables	ROA	ROE
Ll. (ROA/ROE)	0.4619***	1.024***
Liquidity	-0.00422***	-0.00284***
CR	0.0421***	0.616***
NPL	-0.017	0.2552
Bank Size	0.0231***	-0.554***
Leverage	-0.0064***	0.1331***
No of obs	84	84
No of Instruments	37	37
No of Banks	17	17
Hansen Test	0.999	0.998
AR2	0.432	0.313

*** significance at 1%. Liquidity is liquidity ratio of banks, CR is capital ratio, NPL is non-performing loans ratio, bank size is calculated by taking the log of total assets and leverage is the leverage ratio.

Table **7** show the impact of liquidity risk on the financial performance of Islamic banks. Results of GMM analysis depict liquidity risk is negatively related to the ROA of Islamic banks. The value of coefficient is -0.00284 for ROE and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Bank Size and Leverage is 0.0421, -0.017, 0.0231 and -0.0064 respectively. All the coefficients are significant at 99% confidence interval except NPL which is insignificant. The value of Hansen test is 0.999 which shows the instruments are valid and uncorrelated with the error term. This indicates that overidentification issues are not present in the model. The value for AR2 is 0.432 which shows that the residuals do not exhibit significant second-order serial correlation, supporting the model's validity.

Results of GMM analysis further depict that liquidity risk is negatively related to the ROE of Islamic banks. The value of coefficient is -0.00422 for ROA and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Bank Size and Leverage is 0.616, 0.2552, -0.554 and 0.1331 respectively. All the coefficients are significant at 99% confidence interval except NPL which is insignificant. The value of Hansen test is 0.998 which shows the instruments are valid and uncorrelated with the error term. This indicates that overidentification issues are not present in the model. The value for AR2 is 0.313 which shows that the residuals do not exhibit significant second-order serial correlation, supporting the model's validity.

When short-term funding sources like deposits or short-term loans become too expensive or unavailable, banks that depend significantly on them may experience liquidity problems. The inability to roll over short-term loans or an unexpected withdrawal of deposits might put a strain on a bank's liquidity. The negative relationship is consistent with both the operational result (ROA) and the market return (ROE). A bank may encounter liquidity issues if it depends too much on short-term funding sources, such as deposits or short-term loans, when those sources are unavailable or too costly. The liquidity situation of a bank may be strained by an abrupt withdrawal of deposits or by an inability to roll over short-term loans. Previous research like Yahaya *et al*. (2022) support these results.

Liquidity risk has a substantial negative impact on Islamic banks' financial performance. The chance that a bank will not pay its short-term debts without suffering large losses is known as liquidity risk. If a bank depends significantly on erratic and costly short-term financing sources like customer deposits or short-term loans, then this risk becomes much more concerning. Banks that experience liquidity problems may have to borrow money at exorbitant interest rates or sell assets fast at a loss, both of which reduce profitability. The negative impact of liquidity risk on financial performance detriment Islamic banks, even when they adhere to Shariah compliance, which places moral and operational obligations on them. The results emphasize how crucial it is to handle liquidity risk effectively. Banks must find a balance between avoiding excessive risk-taking, which can cause instability, and maintaining a sufficient amount of liquid assets to guarantee stability. The results are consistent with previous studies like Hashim *et al*. (2022).

This data indicates that while liquidity risk has a negative impact on all banks, Islamic banks are more severely impacted. The operational and regulatory frameworks of Islamic banks have a number of fundamental features that contribute to this variation in effect magnitude. Compared to conventional banks, Islamic banks frequently have less flexibility in managing liquidity because of their commitment to Shariah standards. Their inability to use certain financial instruments, such as interest-bearing loans, may hinder their capacity to adequately address liquidity emergencies (Abdo *et al*., 2023).

Moderating Impact of Credit Risk on Liquidity Risk and Performance of Islamic and Conventional Banks

Table 8. Moderating Impact of Credit Risk on the Relationship Between the Liquidity Risk and Performance of Conventional Banks.

Variables	ROA	ROE
Ll. (ROA/ROE)	0.996***	1.0036***
LIQNPL	-0.00143***	-0.0021***
CR	0.003**	0.051***
NPL	0.016***	0.0229***
Liquidity	0.00035***	0.0008**
Bank Size	-0.025	0.0506***
Leverage	0.0021	0.0022**
No of obs	140	140
No of Instruments	38	38
No of Banks	28	28
Hansen Test	0.877	0.874
AR2	0.365	0.542

*** significance at 1%. **significance at 5%. LIQNPL is the moderator which is obtained by multiplying the liquidity ratio with non-performing loan ratio. Liquidity is liquidity ratio of banks, CR is capital ratio, NPL is non-performing loans ratio, bank size is calculated by taking the log of total assets and leverage is the leverage ratio.

Table **8** depicts the moderating impact of credit risk on the relationship between the liquidity risk and performance of conventional banks and the results show that credit risk significantly and negatively moderates the relationship between the liquidity and return on asset of the conventional banks. The value of coefficient is -0.00143 and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Liquidity, Bank Size and Leverage is 0.003, 0.016, 0.00035, -0.025 and 0.0021 respectively. The values of coefficients for NPL, Liquidity are significant at 99% confidence interval. The value of coefficient for CR is significant at 95% confidence interval. The coefficient values for bank size and leverage are insignificant. The value of Hansen test in 0.877 which shows that the validity of instruments and the value of AR2 is 0.365 which shows the absence of second order serial correlation.

The results also show that credit risk significantly and negatively moderates the relationship between the liquidity and return on equity of the conventional banks. The value of coefficient is -0.0021 and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Liquidity, Bank Size and Leverage is 0.051, 0.0229, 0.0008, 0.0506 and 0.0022 respectively. All the values are significant at 99% confidence interval except liquidity which is significant at 95% confidence interval. The value of Hansen test in 0.874 which shows that the validity of instruments and the value of AR2 is 0.542 which shows the absence of second order serial correlation.

Table 9. Moderating Impact of Credit Risk on the Relationship Between the Liquidity Risk and Performance of Islamic Banks.

Variables	ROA	ROE
Ll. (ROA/ROE)	0.623***	1.012***
LIQNPL	-0.00013***	0.00087
CR	0.003***	0.462***
NPL	0.023**	0.138

Liquidity	0.0017***	-0.0582***
Bank Size	-0.023***	-0.286
Leverage	0.017***	0.183**
No of obs	84	84
No of Instruments	37	37
No of Banks	17	17
Hansen Test	1.00	1.00
AR2	0.610	0.320

*** significance at 1%. **significance at 5%. LIQNPL is the moderator which is obtained by multiplying the liquidity ratio with non-performing loan ratio. Liquidity is liquidity ratio of banks, CR is capital ratio, NPL is non-performing loans ratio, bank size is calculated by taking the log of total assets and leverage is the leverage ratio.

Table **9** shows the moderating impact of credit risk on the relationship between the liquidity risk and performance of conventional banks and the results show that credit risk significantly and negatively moderates the relationship between the liquidity and return on asset of the Islamic banks. The value of coefficient is -0.0013 and it is significant at 99% confidence interval. The value of coefficient for CR, NPL, Liquidity, Bank Size and Leverage is 0.003, 0.023, 0.0017, -0.023 and 0.017 respectively. The values of coefficients are significant at 99% confidence interval except the NPL which is significant at 95% confidence interval. The value of Hansen test in 1 which shows that the validity of instruments and the value of AR2 is 0.61 which shows the absence of second order serial correlation.

The results also show that credit risk is insignificant in moderating the relationship between the liquidity and return on equity of the Islamic banks. The value of coefficient for CR, NPL, Liquidity, Bank Size and Leverage is 0.462, 0.138, -0.0582, -0286 and 0.183 respectively. The values of coefficients are significant at 99% confidence interval except the NPL and bank size which is insignificant and the value of leverage which is significant at 95% confidence interval. The value of Hansen test in 1 which shows that the validity of instruments and the value of AR2 is 0.32 which shows the absence of second order serial correlation.

The negative moderating relationship implies that the relationship of liquidity risk and financial performance is even worsened in the presence of credit risk for conventional banks (Widyawati *et al*., 2022). In the event that credit risk is already elevated, the banks opt to mitigate liquidity risk. Investing in extremely marketable, low-yield assets is the plan here. By doing this, the bank is able to prioritize liquidity while maintaining a manageable amount of default risk (Darlami, 2023). When credit risk for conventional banks adversely modifies the relation between liquidity and return on assets, it suggests that the difficulties associated with managing credit risk outweigh the advantages of preserving liquidity. The bank's profitability is limited even if it has a lot of liquidity because of things like higher provisioning, risk-averse lending procedures, declining asset quality, market perception, funding costs, and regulatory restrictions.

Islamic banks, which follow Sharia law, are frequently obliged to make investments in morally and Sharia-compliant securities. It can be difficult, though, to find a balance between preserving liquidity and generating competitive returns. Choosing excessively cautious investments as a means of managing liquidity could result in a reduced total return on assets (Hussein *et al*., 2023). It's crucial to remember that equity is the shareholders' remaining interest following the deduction of liabilities, and the effect of credit risk on equity is based on how severe losses are. Investments that are morally and socially conscious are prioritized in Islamic finance. The bank is less likely to engage in high-risk or speculative initiatives that could increase credit risk because of the SSB's oversight, which guarantees that the bank's operations are in line with these principles (Chowdhury *et al*., 2023b).

5. CONCLUSION AND PRACTICAL IMPLICATION

Bank must consider both liquidity and credit risks. This research investigates the impact of liquidity risk on the performance of Islamic and conventional banks. Moreover, it also investigated the moderating impact of credit risk on the relationship between liquidity and performance. Both Islamic and conventional banks' returns on assets (ROA) and returns on equity (ROE) are impacted by negative relation between credit risk and liquidity. Liquidity in both banking sectors refers to the capacity to fulfil immediate obligations, whilst credit risk denotes the possibility of losses from borrower defaults. Credit risk tends to rise when liquidity declines, according to the documented negative connection. This dynamic makes it difficult for banks to manage credit risk exposures effectively while retaining liquidity. As a result, ROE and ROA are negatively impacted. Even with Islamic banks, which prioritize risk-sharing and ethical investing in accordance with Sharia law, the negative link between credit risk and liquidity nevertheless affects their bottom line. In a similar vein, conventional banks that function under a traditional banking framework also encounter this adverse correlation, which affects their ROA and ROE.

While their business models and approaches to risk management are different, both kinds of banks struggle to maintain profitability by striking a balance between credit risk and liquidity. Effective risk management techniques help in reducing credit risk and preserving sufficient liquidity levels is highlighted by this moderation. The comparison study shows that Islamic and conventional banks are susceptible to same dynamics with regard to liquidity, credit risk, and financial performance even though they operate under distinct principles.

This research has several implications. First, this research is conducted in Asia Pacific region, where the comparison of Islamic and conventional banks regarding the liquidity and credit risk is still missing. This is the region where majority of Islamic banks are working parallel to conventional counterparts. Even Islamic banks, despite of the fact that they Sahirah complaint, must highlight how crucial it is to keep sufficient liquidity buffers in place to lessen the effects of unforeseen circumstances and lower the possibility that credit risk will arise. The research advances financial theory by examining the distinctions between Islamic and conventional banks with regard to credit risk mitigation and liquidity management. It offers insights into the distinctive qualities of Islamic finance and how, in contrast to traditional banking, they affect risk management procedures.

This research has certain limitations also. First, the sample can be increased by adding more Islamic and conventional banks to generalize the results. More variables can be added in the model to increase the robustness. Liquidity risk has several other measurements which can be added.

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