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THE IMPACT OF CREDIT RISK AND LIQUIDITY RISK ON THE BANK PROFITABILITY OF PAKISTAN

Rana Tanveer Hussain[*1], Mariam Rao[2], Naumaan Chaudhary[3], Ali Afzal[4], Tayyab Ali[5]

*[*1,4,5]School of Business and Management Sciences, Minhaj University Lahore*
[2]Assistant Professor Finance, Forman Christian College, University, Lahore
[3]Assistant Professor Forman Christian College, University, Lahore

[*1]ranatanveerh@mul.edu.pk, [2]marriamrao@fccollege.edu.pk, [3]naumaanchaudhary@fccollege.edu.pk

ABSTRACT

The study aimed to assess how credit and liquidity risks influence the profitability of banks, focusing on 29 Pakistani banks from 2010 to 2022. Mismanagement of asset-backed securities led to the worldwide financial crisis of 2008, which had far-reaching consequences, especially for Pakistan, where the banking industry is vital to the country's economy. Panel regression was applied to assess the objective. In order to compare fixed and random effects, the study also used the Hausman Test, which finally favored fixed effect models. The findings highlight how crucial it is to manage credit and liquidity risks in order to preserve Pakistani banks' stability and profitability. The findings of the study reveal a positive correlation between liquidity risk and Return on Assets (ROA), indicating that as liquidity risk increases, ROA also tends to increase. Conversely, a negative relationship was observed between credit risk and ROA, suggesting that as credit risk rises, ROA tends to decline. The study benefits to managers, regulators, and investors, as they highlight the need to manage liquidity and credit risks effectively to maintain profitability. This study contributes to the existing body of knowledge on the impact of credit risk and liquidity risk on bank profitability, providing a foundation for future research.

Keywords: *Credit risk, liquidity risk, profitability, ROA*

INTRODUCTION

Scannella and Polizzi (2021) investigate the idea that risk disclosure is a crucial element in determining the performance of financial markets and financial policies. Woo et. al. (2021) argue that the credit risk is similar and on average among shipping and logistic industries, and also find that the inconsistency in default risk is higher in the shipping industry. Blanco et. al. (2021) found that loan portfolio risk increases with the direct effect of female loan officers and female loan officers gender effect and female borrower decrease portfolio credit risk of MFIs. According to Abdelaziz, Rim, and Helmi's research from 2020, the MENA region's banks perform better when there is rule of law, which also reduces credit and liquidity risk. Abbas, Ali, Yousaf, and Wong, (2021) learn how banks' risk-taking varies with their capitalization and market conditions by examining funding liquidity.

For well-capitalized banks and during the 2007 global financial crisis, the effect of funding liquidity on risk-taking is particularly noticeable. According to Ali, Khattak, and Alam (2021), credit risk appears to be declining as bank competition rises. According to their research, tiny Islamic banks are riskier than large conventional banks, but huge Islamic banks are less dangerous than big conventional banks. Ali, Khattak and Alam (2021) analysis show that bank competition increases and credit risk reduce, on the other hand their finding

show that Islamic bank is not at that high risk than conventional bank and similarly small Islamic banks are at stake than small conventional banks. Canh, Schinckus, Su and Chong (2021) case study show that if an institute improves its quality, it will reduce the banking risk factor. Quality factor is not that much important in well-capitalized and more profitable states and in countries with high economic growth. Cincinelli and Piatti (2021) Results have shown that increase in non-returnable loans (Default loans) in Italy caused banks to get back their loans from the borrowers due to banks limited lending monitoring procedures. Poudel (2013) studies shows that due to high inflation at macro level and currency exchange rates in foreign has increase the credit risk in Nepal. Bandara, Jameel and Athambawa (2021) says that in Sri Lanka Profitability of the banks is measured with important factors such as credit risk. Khalid, Hassan, Ibrahim, Abdullah, Ahmed and Sarea (2021) their studies shows that in Sudan profitability is affected by credit risk. Evidence has shown that 57% of profitability was affected by Non-Performing Loans and Capital Adequacy Ratio Change. Sanatkhani and Bazzazan (2021) findings show that decrease in the interest rate and monitoring policies has cause credit losses and defaulted Iran's economy. Due to that issue of poor management of decrease in interest rate and bad follow up policies cause Iran's economy to go default. Abdelaziz, Rim and Helmi, (2020) say if the banks do not follow law and order as an institutional quality, it will increase Liquidity risk and credit risk and vice versa. Yousaf, Abbas, and Wong (2021) Risk-taking ability of US commercial banks are linked to liquidity risk. Additionally, a funding shortage is less likely to affect banks with larger deposits.

Jo, Kim, and Santos, (2022) finding shows that in Chinese banking sector liquidity risk has affected the Demands of items. Liquidity risk caused excess returns and it has risked high quality Goods future in chines markets. Gogo and Arundina (2021) said that liquidity risk is affected by financing. Islamic banking system in Indonesia has reduces liquidity risk as they always maintain financing, level of profitability and capital adequacy. Gogo and Arundina (2021) said that liquidity risk is affected by financing. Islamic banking system in Indonesia has reduces liquidity risk as they always maintain financing, level of profitability and capital adequacy. Abbas, Iqbal and Aziz (2020) discover that the relationship between bank liquidity and bank capital ratio is improved by the regression of small banks. However, in larger banks, there has been evidence of a bad correlation between bank capital ratio and liquidity risk. Although it appears that bank risk has a positive impact on bank capital ratio, this impact is very minimal in smaller banks, where it is actually negative. But in larger and commercial banks, the risk of banks is still high. According to Pham, Truong, and Bui's research from the year 2021, liquidity risk and credit risk are negatively correlated. Further proof that liquidity risk has a significant and negative impact on bank profitability risk-taking suggests that banks with low liquidity risk are more willing to take bigger risks, whereas credit risk has a significantly more positive impact on risk-taking.

Pakistan's banking sector has faced persistent challenges, particularly in managing credit and liquidity risks, which stem from both domestic economic instability and shifts in global financial conditions. These risks have been at the heart of the sector's vulnerabilities, often influencing profitability and operational stability. Credit risk, defined as the likelihood of a borrower defaulting on their loan, has been a long-standing issue for Pakistani banks. This problem is magnified during recessionary periods, when the overall economic slowdown leads to higher levels of loan defaults. The banking sector's high ratio of non-performing loans (NPLs) is largely a reflection of the struggling economy and the inadequate credit risk management practices employed by many banks.

In addition to credit risk, liquidity risk has been a major obstacle for the banking sector. Liquidity risk, which refers to a bank's ability to meet its short-term financial obligations, is a significant concern, especially in an industry heavily reliant on short-term deposits. This reliance creates a mismatch between short-term liabilities and long-term assets, making banks more vulnerable to liquidity shortages. Economic shocks, such as declines in foreign reserves or episodes of capital flight, further exacerbate these liquidity issues by restricting the availability of funds. The situation is

compounded by Pakistan's underdeveloped capital market, which limits banks' access to long-term funding options.

The greatest hazard to banks is credit risk. When counterparties or debtors break their end of the bargain, it occurs. Defaulting on a loan's principal or interest payment is one example. Mortgages, savings cards, and securities with a guaranteed rate of return can all default. Derivatives and given guarantees are two other instances where obligational contracts can fail to be met. Banks can reduce their exposure in a number of ways, but they cannot completely eliminate the risk of credit due to the nature of their business model. To decrease liquidity issues, regulations are in place. They call for banks to keep a certain amount of liquid assets on hand so they may continue operating even in the absence of outside funding.

Liquidity in the financial markets refers to how quickly an investment can be sold without having an adverse effect on its price. The faster an investment may be sold, the easier it is to sell it for fair value or current market value (and vice versa). When all else is equal, more liquid assets frequently trade at a premium and less liquid assets at a discount. A company's liquidity is a measure of how quickly it can meet its short-term financial obligations in accounting and financial analysis. According to Bhattacharya and Thakor (1993), banks exist because they carry out two fundamental tasks: first, they provide liquidity, and second, they manage risk. The definition of the closed relationships between credit risk and liquidity risk. Credibility and liquidity have been regarded as imperially important in the crucial factors affecting the probability of the banks, as the financial crisis created the situation of the bank run among many risk factors. This industry was greatly affected by the financial crisis. Additionally, the effect of cross-sectional credit and liquidity risk on bank profitability is also needed to be highlighted. This study not only demonstrated the individual both risk but also their interactional impact on profitability was posited. In this study, Pakistani banks are used to examine how Profitability of banks is impacted by credit risk and liquidity risk in a moderating manner.

In this study, we make use of information on 29 banks that are listed on the state banks and stock exchange. We selected all banks of Pakistan to analysis the data and achieve its different reviews that explore the interaction between the credit risk and liquidity risk and banks profitability of the Pakistani banks we use data from the 2010 to 2022 which huge development are come in the banking sector. Pakistani banks system changes within Global banking system, and it's performing all function and program to its customers in Pakistan. The financial sector is essential to an economy's efficient operation. It focuses financial resources on the real estate market, promoting capital formation and streamlining financial exchanges. Economic progress requires a strong and stable financial system. The obtained results show that Pakistani banks' profitability is highly vulnerable to rising credit and liquidity issues. Additionally, we have discovered that the level of credit and liquidity risk has a different relationship with bank profitability. Findings of the study reveal mixed results summarized as follow: Firstly, the individual effect of the credit and liquidity risk was differential. Credit risk inversely affected the bank performance whereas liquidity risk positively related to the bank performance.

It is recommended that banks should manage credit activities more carefully to achieve more profitability. Banks should avoid the non-performing loans as much as possible. Liquidity risk provoke the banks to possess more liquidity resources to grasp more favorable income. This result showed alignment with the risk and return trade off, that high risk reaps high return. Secondly, the interactional influence of credit risk and liquidity risk was contrary wise on profitability. Consistent with Hamdi and Can (2020) and Rachdi, Hakimi and Guesmi (2018), the interactional outcome demonstrates alignment with risk and return trade off. High risk brings incremental and favorable return for the banks.

Literature Review

Scannella and Polizzi (2021) investigate the idea that risk disclosure is a crucial element in enhancing the effectiveness of financial markets and financial stability. Woo, Kwon and Yuen (2021) argue that the credit risk is similar and on average among shipping and logistic industries,

and also find that the inconsistency in default risk is higher in the shipping industry.

The Author further claimed that both industries are significantly impacted by the equity and current ratios. When investigations are further divided into several locations (i.e., Asia, EU, USA, and Africa), there are very minor changes in the factors that determine credit risk. Blanco, Reguera and Veronesi, (2020) found that loan portfolio risk increase with the direct effect of female loan officers and female loan officers gender effect and female borrower decrease portfolio credit risk of MFIs. Abdelaziz, Rim and Helmi, (2020) discovered that the institutional quality of law and order improves bank performance in the MENA area and lowers credit and liquidity risk. For banks with adequate capital, the effect of financing availability on risk taking was especially apparent during the 2007 global financial crisis. The relationship between funding liquidity and bank risk-taking and market conditions is examined by Abbas, Ali, Yousaf, and Wong (2021). According to Mpofu and Nikolaidou (2018), Ali, Khattak, and Alam (2021), credit risk appears to be declining as bank competition rises. According to their findings on the size impact, Small Islamic banks are riskier than small conventional banks, and both large and small Islamic banks carry greater risk. In contrast, their findings indicate that Islamic banks are not at that high risk compared to conventional banks, and small Islamic banks are similarly at risk compared to small conventional banks. According to Ali, Khattak, and Alam's analysis from 2021, bank competition is increasing and credit risk is decreasing.

The case study by Canh, Schinckus, Su, and Chong from 2021 demonstrates how an institution can lower the risk factor for banks by improving its quality. In well-capitalized, more profitable governments and nations with substantial economic growth, the quality component is not as significant. Poudel (2013) studies shows that due to high inflation at macro level and currency exchange rates in foreign has increase the credit risk in Nepal. Bandara, Jameel and Athambawa (2021) says that in Sri Lanka Profitability of the banks is measured with important factors such as credit risk. Khalid, Hassan, Ibrahim, Abdalla, Ahmed and Sarea (2021) their studies shows that in Sudan profitability is affected by credit risk. Evidence indicates that changes in the capital adequacy ratio and non-performing loans had an impact on 57% of profitability. Sanatkhani and Bazzazan (2021) findings show that decrease in the interest rate and monitoring policies has cause credit losses and defaulted Iran's economy. Due to that issue of poor management of decrease in interest rate and bad follow up policies cause Iran's economy to go default.

Shahdadi, Rostamy, Sadeghi Sharif and Ranjbar (2020) said that assets liquidity has negative on the bankruptcy and on other hands stocks liquidity has not that much impact on bankruptcy Abdelaziz, Rim and Helmi, (2020) says if the banks do not follow up law and order as an institutional quality it will increase Liquidity risk and credit risk and vice versa. Abbas, Yousaf and Wong (2021) the ability of US commercial banks to accept bank risks is related to liquidity risk. Additionally, funding shortage is less likely to affect banks with higher deposits.

Jo, Kim, and Santos, (2022) finding shows that in Chinese banking sector liquidity risk has affected the Demands of items. Liquidity risk caused excess returns and it has risked high quality Goods future in chines markets. Gogo and Arundina (2021) said that liquidity risk is affected by financing. Islamic banking system in Indonesia has reduces liquidity risk as they always maintain financing, level of profitability and capital adequacy. Gogo and Arundina (2021) said that liquidity risk is affected by financing. Islamic banking system in Indonesia has reduces liquidity risk as they always maintain financing, level of profitability and capital adequacy. Abbas, Iqbal and Aziz (2020(found that bank liquidity and bank capital ratio are positively impacted by small banks regression. On the other hand, larger banks have shown a bad correlation between bank capital ratio and liquidity risk. Although it appears that bank risk has a beneficial influence on bank capital ratios, smaller banks actually experience a negative impact. But at larger and commercial banks, bank risk remains significant.

Findings from Pham, Truong, and Bui from 2021 demonstrate an inverse relationship between credit risk and liquidity risk. Further evidence that banks that take less risk are more willing to take bigger

risks is provided by the significant and negative impact of liquidity risk on bank profitability, while credit risk has a very positive effect on a bank's performance. The two basic perspectives have emerged from the research on the connection between credit and liquidity issues. The financial intermediation theory is the basis of the first viewpoint. Credit risks in banks are found to positively correlate, according to several research. They claimed that financing risk taker or troubled projects results in a rise in NPLs, which reduces bank liquidity and makes it is more challenging for banks to satisfy depositors' financial demands (Acharya &Viswanathan, 2011; Gor-ton &Metrick, 2011; He & Xiong, 2012). According to CAI and Zhang (2017), a high degree of non-performing loans prevents banks in the Ukrainian environment from responding to requests for partial or full withdrawals. This is true during the period between Q1 2009 and Q4 2015. As a result of this circumstance, the cash flow is reduced, loan assets experience depreciation. Sufian (2009) examined the factors affecting bank profitability in the context of Malaysia.

Ahmad et. al. (2021) studies express that Bank managers should use risk management strategies in commercial banks to overcome financial risks in Pakistan. While having trade credit services they should have extra cash. Waspada (2020) verdict that technology has impressive positive impact on market size and firm size in liquidity risk, on other hands Bank Capital and Bank performance has progressive effect but not that much important as liquidity risk Hang, Thai and Giang (2021) Liquidity risk and technological investment go hand in hand. The size of the bank, the ratio of Provision for Credit Losses (PCL) to the total credit outstanding, the ratio of equity to total assets, the ratio of loans to total assets, the ratio of the bank's net interest margin, the ratio of cost to income, the ratio of provision for credit losses (PCL) to the total credit outstanding, The liquidity risk is influenced by the following ratios: equity to total assets; loans to total assets; net interest margin of the bank; and economic growth. Managing liquidity risk is correlated with bank success. Thai and Giang (2021) Liquidity risk and technological investment go hand in hand. the size of the bank, the ratio of Provision for Credit Losses (PCL) to the total amount of outstanding credit, the ratio of equity to total assets, the ratio of loans to total assets, the bank's net interest margin, the ratio of cost to income, and economic growth have all been linked to financial performance. Liquidity risk management is linked to bank performance when deposits are made in Nigerian banks, according to Jacob, Ringim, and Shuaibu (2022). According to a study, deposits should be kept at their maximum level.

H1: Liquidity risk has significant effect on bank profitability.

Both of them, in which liquidity risk and bank profitability have unclear relation. Such as, some practical studies described this liquidity moves confidently Although many others have also discussed the profitability of banks (Bourke, 1989; Kosmidou, Tanya, & Pasiouras, 2005; Olagunju, David, & Samuel, 2012), determinant explore the link which is enhancing the liquidity removes oppose sing result on bank profitability under of the possessions.

This undesirable relation defines by sometime of liquidity risk more than a few revisions. Liquidity risk and bank profitability have negative relation between them, so far in this purpose which choose a test its basically for the Iranian example, this study is done for the purpose of the Iranian commercial banks were studied by Tabard, Hamada, and Umami (2013) for a sample throughout the course of (2003–2010). The authors of Iranian banks explained how the profitability is negatively and considerably impacted by the credit and liquidity issues. The first variable of the study is liquidity risk, and the second is bank profitability. How may they be attracted to one another? The study by Theatric and Anees (2012) examined the relationship between these variables using data from 22 Pakistani banks throughout the years (2004–2009). The findings showed a weak and negative relationship between liquidity risk and bank profitability. Furthermore, their studies show that the liquidity gap and the quantity of NPLs are the primary factors that Iranian commercial banks were studied by Tabard, Hamada, and Umami (2013) for a sample throughout the course of (2003–2010). The authors of Iranian banks explained how the profitability is

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negatively and considerably impacted by the credit and liquidity issues. The first variable of the study is liquidity risk, and the second is bank profitability. With the reference of these findings of these studies-based review which show this relation between them, and we also generate a hypothesis in this literature on the base of this study. Therefore, credit and liquidity risks are able to work together as risks, and based on the two hypotheses that were developed above that suggested a Since both credit and liquidity concerns have had a negative influence on bank profitability thus far in this region, we should need to create a third hypothesis in order to better understand the situation. Here we develop a second hypothesis to understand the connection:

H2: Credit risk has significant effect on bank profitability.

Research Methodology

The research approach used in the study was deductive method which provide guideline about the testing of a generalized aspect from a specific case study, in the context of financial sector of Pakistan. Research choice of the study was quantitative in nature where the numerical methodology extracting from econometric techniques was applied. Purpose of the research was to explanatory. The explanatory research entails the detail of causal effect of some factors on another factor. How was the impact of credit risk and liquidity risk on bank profitability assessed in this instance?

Data was surveyed from the annual report published by the State Bank of Pakistan. State bank published annual data on the analysis of financial statements of financial and non-financial sectors. This used data of 29 banks for the period of 2010-2022 and panel was made accordingly. Bank profitability was measured using to accounting ratio ROA and ROE. ROA mean return on assets and ROE mean return on equity. NPLGA means credit risk and its formulation is that (non-performing loans to gross loans %). GAD means liquidity risk which is measured with the help of the (Loans to deposit ratio (%). NPLGA*GAD is interactional term which explore the relationship between the credit risk and liquidity risk. GABD is term which uses for the Gross advances /borrowing & deposit (%). PNGA mean that provisions against non-Performing loans / gross advances. CLR mean is capital ratio who explore the Capital /leverage ratio). BVPS mean Break-up value / per share. DTE mean Total deposit /total equity (time). CFO mean cash from operations (Cash generated from operation activities / profit after tax (times). Table 1 summarizes the description of all variables. D economicnometric model of the study is mentioned as follow:

$$PROF_{i,t}=B_0+B_1NPLGA_{i,t}+B_2GAD_{i,t}+B_3GABD_{i,t}+B_4PNGA_{i,t}+B_5CLR_{i,t}+B_6BVP_{i,t}+B_7DTE_{i,t}+B_8CFO_{i,t}+e_1 \ldots(1)$$

Table 1: Description of the Variables

Definition	Meaning	Definition of the variables
ROA	Probability	Return on assets (ROA)
NPLGA	Credit risk	Bank NPLs to gross loans (%)
GAD	Liquidity risk	Loans to deposit ratio (%)
GABD	Gross advance	Gross advances /borrowing & deposit (%)
PNGA	Provision for NPLs	Provisions against NPLs / gross advances
CLR	Capital leverage	Capital /leverage ratio)
BVPS	Breakup value per	Break-up value / per share
DTE	Total deposits	Total deposit /total equity (times)
CFO	Cash operation	Cash generated from operation activities / profit after tax

Results and Discussion

The variables' descriptive analysis is explained in Table 2. The association between ROA and bank profitability is explained by descriptive statistics. The ROA's minimum and maximum values are -0.110 and 0.183, respectively, with an average value of 0.006. Return on equity (ROE), is a measure of a bank's profitability. In this sense, the

ROE has an average value of 0.019 and a maximum and minimum value of 2.347 and -23.924, respectively. NPLGA stands for non-performing loan to gross advances accepted for the banks' credit risk purpose. Its average value is 0.162, with 0 and 0.9999 serving as its minimum and highest values, respectively.

Gross advances to deposits, (GAD), have an average value of 1.867 and a maximum value of 41.489, and a low value of -0.309. The GABD has an average value is 0.620, with a minimum of -0.199 and maximum value of 4.175. The PNGA has an average value is 0.247, with a minimum of 0.000 and maximum value of 1.690. The CLR has an average value of -0.127 and a maximum and minimum value of 0.502 and -7.210, respectively. The BVPS has an average value of 55.610 and a minimum and highest value of -17.750 and 1601.520, respectively. The DTE's average value is 12.585, with a minimum of -42.450 and a top of 627.850. The CFO has an average value of 4.954 and a minimum and greatest value of -1172.470 and 579.180, respectively.

Table 2: Descriptive Analysis

Variable	Obs	Mean	Std. dev.	Min	Max
Company id	377	15.000	8.378	1.000	29.000
Year	377	2016	3.747	2010	2022
ROA	377	0.006	0.020	-0.110	0.183
GAD	377	1.867	6.163	-0.309	41.489
GABD	377	0.620	0.481	-0.199	4.175
NPLGA	377	0.167	0.214	0.000	0.999
PNGA	377	0.247	0.346	0.000	1.690
CLR	377	-0.127	1.141	-7.210	0.502
BVPS	376	55.610	184.104	-17.750	1601.520
DTE	376	12.585	38.332	-42.450	627.850
CFO	376	4.954	74.555	-1172.470	579.180

ROA means return on assets, GAD means loans to deposit ratio, GABD means gross advance /borrowing & deposit, NPLGA means bank NPLs to gross loans, PNGA means provisions against NPLs, CLR means capital leverage ratio, BVPS means break-up value per share, DTE means total deposit /total equity and CFO means cash generated from operation activities.

The correlation coefficient between the variables is explained in Table 3. The association between ROA and ROE is 0.1245 which means they have positive relationship. The connection between liquidity risk and (ROE) is -0.0118 which means they have negative relationship and relationship between liquidity risk and ROA is 0.4652 which means they have positive relationship. The link between GABD and ROE is -0.0517 which means they have negative relationship and association between GABD and ROA is -0.1159 which means they have negative relationship and link between GABD and liquidity risk is -0.0189 which means they have negative relationship. The association between credit risk and ROE is -0.1598 which means they have negative relationship and connection between credit risk and ROA is -0.0793 which means they have negative relationship and link between credit risk and liquidity risk is 0.6729 which means they have positive relationship and association between credit risk and GABD is 0.0819 which means they have positive relationship.

The link between PNGA and ROE is -0.0603 which means they have negative relationship and association between PNGA and ROA is -0.0086 which means they have negative relationship and connection between PNGA and liquidity risk is 0.3578 which means they have positive relationship and relationship between PNGA and GABD is -0.0656 which means they have negative relationship and link between PNGA and credit risk is 0.4224 which means they have positive relationship. The association between CLR and ROE is 0.0061 which means they have positive relationship and connection between CLR and

ROA is -0.4082 which means they have negative relationship and relationship between CLR and liquidity risk is -0.875 which means they have negative relationship and link between CLR and GABD is 0.1896 which means they have positive relationship and association between CLR and credit risk is -0.7407 which means they have negative relationship and connection between CLR and PNGA is -0.4224 which means they have negative relationship. The relationship between BVPS and ROE is 0.0189 which means they have positive relationship and link between BVPS and ROA is 0.083 which means they have positive relationship and correlation between BVPS and liquidity risk is -0.00891 which means they have negative relationship and correlation between BVPS and GABD is 0.564137 which means they have positive relationship and association between BVPS and credit risk is -0.01073 which means they have negative relationship and connection between BVPS and PNGA is -0.01563 which means they have negative relationship and relationship between BVPS and CLR is 0.089626 which means they have positive relationship.

The association between DTE and ROE is -0.78076 which means they have negative relationship and connection between DTE and ROA is -0.06672 which means they have negative relationship and relationship between DTE and liquidity risk is -0.06116 which means they have negative relationship and link between DTE and GABD is -0.03286 which means they have negative relationship and association between DTE and credeit risk is 0.039496 which means they have positive relationship and connection between DTE and PNGA is 0.019978 which means they have positive relationship and relationship between DTE and CLR is 0.052371 which means they have positive relationship and link between DTE and BVPS is -0.05008 which means they have negative relationship. The association between CFO and ROE is 0.011312 which means they have positive relationship and link between CFO and ROA is 0.026447 which means they have positive relationship and connection between CFO and liquidity risk is -0.01553 which means they have negative relationship and relationship between CFO and GABD is -0.0263 which means they have negative relationship and association between CFO and NPLGA is -0.02321 which means they have negative relationship and relationship between CFO and PNGA is 0.014614 which means they have positive relationship and connection between CFO and CLR is 0.013343 which means they have positive relationship and link between CFO and BVPS is -0.00763 which means they have negative relationship and relationship between CFO and DTE is -0.01635 which means they have negative relationship.

Table 3: Correlation Analysis

Variable	ROE	ROA	GAD	GABD	NPLGA	PNGA	CLR	BVPS	DTE	CFO
ROE	1									
ROA	0.12451	1								
GAD	-0.0118	0.46521	1							
GABD	-0.0517	-0.1159	-0.0189	1						
NPLGA	-0.1598	-0.0793	0.6729	0.08188	1					
PNGA	-0.0603	-0.0086	0.35775	-0.0656	0.46952	1				
CLR	0.00609	-0.4082	-0.875	0.18964	-0.7407	-0.4224	1			
BVPS	0.01887	0.08299	-0.0089	0.56414	-0.0107	-0.0156	0.08963	1		
DTE	-0.7808	-0.0667	-0.0612	-0.0329	0.0395	0.01998	0.05237	-0.050	1	
CFO	0.01131	0.02645	-0.0155	-0.0263	-0.0232	0.01461	0.01334	-0.007	-0.016	1

ROA means return on assets, GAD means loans to deposit ratio, GABD means gross advance /borrowing & deposit, NPLGA means bank NPLs to gross loans, PNGA means provisions against NPLs, CLR means capital leverage ratio, BVPS means break-up value per share, DTE means total deposit /total equity and CFO means cash generated from operation activities.

Table 5 shows that Hausman Test was applied on REM and FEM. The coefficient of Hausman test

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reveals significant value. Therefore, Hausman test recommends to go for fixed effect results. Table 4 shows that the fixed effect result on dependent variable. F statistics of the model is significant (F: 12.28, Prob>F : 0.0000) which demonstrate that the model is fit for the analysis. R Square is 0.22 which shows that independent variables cause 22% variation in the dependent variable. The coefficient value of liquidity risk on ROA is 0.0016, it means liquidity risk has positive effect on ROA. P value of liquidity risk on ROA is 0.0000 which is less than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of liquidity risk on ROA is statistically significant. The coefficient value of GABD on ROA is -0.0016, it means GABD has negative effect on ROA. P value of GABD on ROA is 0.5282 which is greater than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of GABD on ROA is not statistically significant. The coefficient value of credit risk on ROA is -0.0473, it means credit risk has negative effect on ROA. P value of credit risk on ROA is 0.0000 which is less than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of credit risk on ROA is statistically significant. The coefficient value of PNGA on ROA is -0.0019, it means PNGA has positive effect on ROA. P value of PNGA on ROA is 0.3550 which is greater than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of PNGA on ROA is not statistically significant. The coefficient value of CLR on ROA is 0.0107, it means CLR has positive effect on ROA. P value of CLR on ROA is 0.0830 which is greater than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of CLR on ROA is not statistically significant. The coefficient value of BVPS on ROA is 0.0000, it means BVPS has positive effect on ROA. P value of BVPS on ROA is 0.5490 which is greater than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of BVPS on ROA is not statistically significant. The coefficient value of DTE on ROA is 0.0000, it means DTE has positive effect on ROA. P value of DTE on ROA is 0.0200 which is less than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of DTE on ROA is statistically significant. The coefficient value of CFO on ROA is 0.0000, it means CFO has positive effect on ROA. P value of CFO on ROA is 0.8730 which is greater than significant level (i.e. 0.1, 0.05 or 0.01). Therefore, the effect of CFO on ROA is not statistically significant. Since, GAD has significant effect on bank profitability therefore, H1 is accepted that " Liquidity risk has significant effect on bank profitability. NPLGA has significant effect on bank profitability, therefore H2 is accepted that "Credit risk has significant effect on bank profitability".

Table 4: Fixed- Effects Regression

ROA	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
GAD	0.0016	0.0002	7.5800	0.0000	0.0012	0.0021
GABD	-0.0016	0.0026	-0.630	0.528	-0.006	0.0035
NPLGA	-0.0473	0.0087	-5.420	0.0000	-0.064	-0.030
PNGA	-0.0019	0.0020	-0.930	0.3550	-0.005	0.0021
CLR	0.0107	0.0061	1.7400	0.0830	-0.001	0.0228
BVPS	0.0000	0.0000	0.6000	0.5490	0.0000	0.0000
DTE	0.0000	0.0000	2.3400	0.0200	0.0000	0.0001
CFO	0.0000	0.0000	0.1600	0.8730	0.0000	0.0000
Cons	0.0133	0.0025	5.2400	0.0000	0.0083	0.0183
N	376.0000					
F	12.2800					
Prob>F	0.0000					
R Sq.	0.2200					

ROA means return on assets, GAD means loans to deposit ratio, GABD means gross advance /borrowing & deposit, NPLGA means bank NPLs to gross loans, PNGA means provisions against NPLs, CLR means capital leverage ratio, BVPS means break-up value per share, DTE means total deposit /total equity and CFO means cash generated from operation activities.

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Table 5: Hausman Test

	Coefficients (b) Fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) Std. err.
GAD	0.001634	0.001595	3.84E-05	.
GABD	-0.001639	0.000197	-0.001837	0.0014999
NPLGA	-0.047341	-0.072266	0.024924	0.0058888
PNGA	-0.001882	-0.002809	0.000927	.
CLR	0.010676	-0.010077	0.020752	0.0058994
BVPS	2.92E-06	9.34E-06	-6.42E-06	1.35E-06
DTE	3.77E-05	2.85E-05	9.23E-06	.
CFO	1.33E-06	4.38E-06	-3.05E-06	.

Test of H0: Difference in coefficients not systematic chi2(7) = 36.31 Prob > chi2 = 0.0000

Conclusion

The primary goal of the study was to ascertain how credit risk and liquidity risk affect bank profitability. The noticeable approach depends on simultaneous solutions. To be more specific, we selected 29 Pakistani banks that provided services to clients between 2010 and 2022. The 2008 global financial crisis affected every economy on the planet. The asset-backed securities securitization financial transaction was the source of the crisis, which was caused by an incorrect assessment of the risk factors. The US banking sector had a default, which had a knock-on effect on related businesses both domestically and internationally. Pakistan's economy is developing. The banking sector is the engine of the economy. Because the financial crisis produced a scenario where a bank run may occur among other risk considerations, credibility and liquidity have been viewed as being extremely significant in the critical elements impacting the possibility of the banks. This sector was severely impacted by the economic downturn. It's also important to emphasize how cross-sectional credit and liquidity risk affect bank profitability. This study proposed an interactional impact on profitability in addition to demonstrating the individual risks. This study uses Pakistani banks to investigate the moderating effects of credit risk and liquidity risk on bank profitability.

The study illustrates how the dependent variable is affected by the fixed effect. ROA is positively impacted by liquidity risk's coefficient value. The liquidity risk's P value on ROA is below the significance level. As a result, liquidity risk has a statistically significant impact on ROA. The ROA is negatively impacted by the GABD coefficient value. The GABD P value on ROA is higher than the significant level. Therefore, there is no statistically significant relationship between GABD and ROA. The ROA is negatively impacted by the credit risk coefficient value. The credit risk's ROA P value is below the significance level. As a result, credit risk has a statistically significant impact on ROA. The favorable impact of PNGA's coefficient value on ROA is observed. The PNGA's P value on ROA exceeds the significance level. As a result, there is no statistically significant relationship between PNGA and ROA. ROA is positively impacted by the coefficient value of CLR on ROA. The CLR on ROA P value is higher than the significant level. Consequently, there is no statistically significant relationship between CLR and ROA. ROA benefits from the favorable impact of the BVPS coefficient value on ROA. The BVPS on ROA P value is higher than the significant level. Therefore, there is no statistically significant relationship between BVPS and ROA. ROA is positively impacted by the DTE coefficient value. The DTE on ROA P value is below the meaningful level. As a result, there is statistically significant DTE influence on ROA. ROA is positively impacted by the CFO coefficient of return on assets. The CFO's ROA P number is higher than the relevant level. Consequently, there is no statistically significant relationship between CFO and ROA.

The study contributes in the following ways: results have important implications for bank

managers, regulators, and investors, as they highlight the need to manage liquidity and credit risks effectively to maintain profitability. This study contributes to the existing body of knowledge on the impact of credit risk and liquidity risk on bank profitability, providing a foundation for future research. The findings and methodology employed in this study can serve as a valuable resource for subsequent students conducting studies in this field. By building upon the insights and results presented here, future researchers can further explore the complex relationships between risk management and bank performance, ultimately advancing our understanding of this critical topic. Additionally, this study's results can inform and guide students in their own research endeavors, providing a framework for investigating related research questions and hypotheses.

It is imperative that banks implement more stringent credit risk management frameworks, guaranteeing early identification of high-risk loans and tighter underwriting requirements, in order to increase their profitability while reducing credit and liquidity issues. Reducing defaults will be aided by proactive action in managing high-risk borrowers and ongoing loan portfolio monitoring. In order to resist unanticipated market shocks, banks must simultaneously improve their liquidity risk management by keeping enough liquid assets and diversifying their funding sources. Adherence to international regulatory frameworks, such Basel III, will augment risk mitigation strategies. Banks can also reduce risk by using cutting-edge technologies like artificial intelligence (AI) for predictive analysis. In order to ensure long-term stability without taking unwarranted risks, banks should combine their pursuit of profitability with sustainable risk management and maintain sufficient capital buffers to absorb future losses. This all-encompassing strategy will enable profitability while lowering hazards.

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