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Determinants of Liquidity Risk: A Study Of Commercial Banks In Pakistan

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ABSTRACT

The aim of this research is to examine the determinants of liquidity risk of commercial banks in Pakistan. For this research, the data of 20 commercial banks of Pakistan is collected annually for eight years ranging from 2012-2020. This study uses the Panel data regression analysis approach. Liquidity ratio as a dependent variable has been selected as measures liquidity risk whereas five independent variables size of bank, liquid assets ratio, capital adequacy ratio, Leverage, Non-performing loans have been selected for different types of bank-specific factors. Fixed effect regression analysis and random effect analysis has been performed, the Hausman test used to see whether the fixed effect model or random model is suitable. The findings of this study are beneficial for policymaker, manager, economic agents to control on risk factors. The results of this study show the size of bank (SOB), liquid assets ratio (LAR), capital adequacy ratio (CAR) has a negative and statistically significant effect on liquidity ratio. However, Leverage (LEV) has a positive and statistically significant effect on liquidity risk meaning that increase in leverage increase the liquidity risk but Non-performing loans (NPLs) has a negative and statistically insignificant relationship with liquidity risk.

Key words: liquidity, liquidity risk, factor of liquidity risk, size of bank, leverage, capital adequacy ratio, liquid assets ratio, Non-performing loans.

INTRODUCTION

This study is about the determinants of liquidity risk of the banking sector of Pakistan. The term "Risk" is a multifaceted and broader concept. The risk is considered as an important aspect in the financial decision and it can be expressed quantitatively as the degree of unfavorable outcomes in banking system (Ashlatti, 2015).

The application and mobilization of funds is the function of banks that make the risk in the banking system. Banks perform the financial intermediation function, for example, a financial institution manager concern with the question like; whether a customer renews the loan or not? What happened in financial institutions income due to fluctuation in interest rate and what is the growth rate of deposits or any other source? The risk is an important element in the investment decision, to achieve the success in banking business a bank must have the ability to manage its risk effectively otherwise the failure of manage the risk may decline the growth of an economy and destabilize the whole financial system (Rose & Hudguis, 2010).

The risk in the financial system broadly classified in at least three aspects: Financial risk, Business risk, Operational risk. All types of risk are correlated with each other change in one

type of risk influence the others. If there is an inconsistency between due dates of assets of the bank and liabilities of the bank as well as internal operations of banks liquidity risk happen. Banks should aware and predict the factors affecting any type of risk. Banking operations are affected by economic and non-economic environment. The credit crunch of banks 2007-2008 has expanded the research into liquidity risk and its management. Most of the researcher gives the secondary importance to liquidity risk in banking literature before the credit crunch of banks (Matz & Neu, 2006). Furthermore, due to the failures of financial institution liquidity risk considered as a most important and a lot of discussions exists on this topic. The nature of banks activities brings about liquidity crisis (Chaplin, Emblow, & Michael, 2000).

The main function of banks is to collect funds and gives the loans to others. So, the banks have to maintain estimated liquidity to perform the daily activities and obligations like fulfill the demand of customer withdrawals of depositors, maintain the provision for credit amenities for borrowers (FSC, 2010). If the banks are able to increase the assets and sure about enough funds then banks convert the short time liquid liabilities into long period illiquid assets. This process gives the protection to the customers from liquidity issue but harmful if bank face liquidity risk, in this bad situation banks unable to run their operations soundly. Liquidity is difficult to define and easy to identify.

The management of liquidity is considered most important and success factor for the banks. If there is a divergence in maturities, conversion of shortened deposits into perpetual loans is the basic function of the banks which becomes apparent the liquidity risk. A bank is unable without any loss to increase the funds or assets and fails to meet the liabilities as they become due. The capacity of the banks to raise the assets and without bearing the loss and extra cost to fulfill the unforeseen obligations and unpredicted cash consider as liquidity. The failure of the banks to pay on maturity without negatively affecting the financial position of the banks is known as liquidity risk. If the management system is effective, it will lead to control the chances of unfavorable events and help to ensure that a bank will pay dues on time.

Commercial banks must have to preserve the statutory requirement of the central bank with the use of proper liquidity management function. Banks keep the appropriate portion of deposits to liquid assets and deposits to loans and advances. If the bank manages the liquidity risk then the chances of liquidation reduce. To create and uphold the confidence of the financial market and depositor is possible if banks hold enough stock of liquid assets. The drawback of a bank must face in case of illiquid, banks buy the funds at a premium if the financial condition of the bank disclosed in financial market. Banks should have to handle the liquidity supply and demand (Ismal, 2010).

Economic stability is essential for improving liquidity management (Reason, 2008). There is a lack of liquidity in the financial market in case of economic stress. In this situation, banks sell assets on lesser than the par value of these assets because banks need the cash on an urgent basis. Banks hold more stock of assets to avail the benefit of investing as a new business against the buying of assets of another business at a low rate that automatically leads toward future profit. In the case of economic crisis, banks have an opportunity to grow the new business when banks stock more liquidity (Acharya, Hynun, & Tanju, 2009).

SBP supervise and control also regulates the banking sector in Pakistan under the prudential regulation. The excellent management of SBP led to growth in the Pakistan's sector of bank which ultimately results in the growth of the economy of the country (Tahir, Shah, & Afridi, 2016). The State Bank of Pakistan perform the function as a last resort but cannot handle the liquidity risk on roots (Nikolaou, 2009).

In Pakistan commercial banks lead the financial sector. Deficiency in liquidity of commercial banks has an enormous inference on the economic progress of Pakistan. Listed banks in Pakistan Securities Exchange can take the advantage of quick entrée in capital markets where liquidity gap can be reduced with the issue of securities. Through the financial services provision, banks are connected to economic development. For economic development, their mediation role is assumed to be a catalytic agent (Ongore & Kausa, 2013).

The largest and essential part of the country's economy is the banking sector of the country. It supports to control the monetary victims in the country. It assists in control the finance in a country. To perk up the financial performance and monetary position banking sector should have to manage the liquidity risk (Ahmad, Ahmad, & Usman, 2011). It is proclaimed that when any businessman or investor take the high risk, he will take the high return. Although, the organizations must be continue on attractive high return. The banking sector is the higher risk taker financial institute. Organizations should have to take defensive measurements to cope the risk. Organizations should have to administer in such a manner that they save the business from unfavorable results after taking the risk.

In Pakistan, liquidity risk has been of major concern over the years. To mitigate liquidity risk the SBP requires banks management to develop and implement adequate liquidity risk policies. The requirements for the commercial bank are to uphold at least thirty percent of liquidity ratio (SBP, 2017). The actual liquidity ratio hence liquidity risk differs among banks. Kamau, Erick, and Muriithi (2013) found that the credit rating, monetary policies, and the government expenditure and the status of payment of balance affected the liquidity of commercial banks. Makka (2013) found that the profitability of banks and liquidity risk had an insignificant relationship.

Liquidity risk can harm the financial position of the bank. So, the administrator of the bank have the priorities to ensure the availability of the funds at a reasonable cost for fulfill the unanticipated demand of borrower and investors. The performance and reputation of the bank are affected by liquidity risk (Ahmad & Jan, 2017). Accountholder maybe fails to keep the confidence on banks when the bank does not supply the amount on time. The bank should have to pay the penalties as per the regulation entail. High liquidity risks deter the Banks ability to meet its liabilities, which in term affects the creditworthiness of the banks, banks lose their customers and start defaulting, and hence it exacerbates the financial crisis of the bank (Comptroller of the Currency, 2001).

A number of studies (Zaghdoudi and Hakimi, 2017; Ebenezer, 2016; Vazquez and Federico, 2015; Leykun, 2016) have been conducted to evaluate the determinants of liquidity risk in developed markets. Fredrick, Jeremiah, and Onsomu (2018) point out that the capital adequacy, capitalization, and size significant positive relationship with liquidity risk. Ebenezer (2016) established that bank size had positively influence on liquidity risk while the ratio of

capital/assets had negatively influence. Many researchers conducted the research on the same problem and concluded in different ways, but a gap is present in the literature due to conflict in results. Therefore, the researcher makes an effort to identify the determinants of liquidity risk on commercial banks in Pakistan in this research, while the studies done in the Pakistan commercial banking environment have largely evaluated the effect of liquidity risk on financial performance; limited attention has been given to the determinants of liquidity risk. This research sought to fill up the gap in knowledge by addressing the following question: What are the determinants of liquidity risk for commercial banks in Pakistan. There is a need to find out what factors contribute to the liquidity risk of commercial banks. So, these factors are to be considered to make the liquidity position of banks to avoid defaults.

LITERATURE REVIEW

Literature included the bank-specific factors of liquidity risk: the size of bank, adequacy of capital, quality of assets and the ratio of liquid assets, ownership type, Non-performing loans (NPLs).

Liquidity Risk

Shah, Khan, Ali, and Tahir (2018) conducted a study to analyze the relationship with liquidity as a dependent variable measured by loan to deposit ratio and conclude that there is no difficulty for the bank to perform function if the bank hold high-quality assets because the bank has sufficient amount of capital as a reserve. Panel data was used. Descriptive statistic and Hausman test were applied.

The study found that bank factors growth rate of economics, size of bank, level of profitability, quality of assets and funding cost had a negative effect on liquidity risk. Inflation rate and rate of deposit and capitalization (capital adequacy) had a positive effect on liquidity risk. Forty-five banks included for a period of twelve years. Panel data regression analysis, the Hausman test technique used to analyze the data. Size of bank calculated with the proxy of a log of total assets (Dutta, 2018).

The research conducted by Al-Harbi (2017) used the unbalanced panel data for nineteen years 1989-2008. This study used the ordinary least square fixed effect model and concluded that the ratio of capital, credit risk, ownership type, the rate of inflation, negative influence on the liquidity risk. Positive impact on liquidity risk with the size, activities related to off-balance sheet, market capitalization. This study used 686 conventional banks including developed and underdeveloped countries that are managed by Organization Islamic Cooperation (OIC).

Size of Bank

Financial institutions hold the more liquidity for their own interest as compare to the past trend. The commercial banks can easily access the financial market. To access the liquidity it depends on the size of bank. Larger banks have more access as compared to smaller banks because larger bank depends on financial markets and central banks when need liquidity. Smaller banks have no easy access because they may be not well known in the financial market. The study showed the significant effect of the size of bank on the bank's liquidity (Bonner, Van, & Zymek, 2015). In contrast, Fredrick et al., (2018) found that the size of bank as an independent variable and concluded that the size of bank had not a significant association with the failure of banks. The reason behind conducted this study is to establish the size effect on the

failure of banks. SBP publish the financial reports annually on the website. The data collected from the website source. To analyze the data e-view 9.5 version was used. Panel logit regression technique was used. Alzoubi (2017) deemed that the foremost factor of liquidity risk of the bank is the size of bank. They suggest that bank size calculated as the natural log of the squared entire amount of assets. If the size of the bank increases, the bank any time approved the loan without facing any dilemma because larger banks have the capacity to move on a huge amount of deposit with any trouble. Further, they noted that the huge monetary promise related to a number of branch openings increases susceptibility to the risk of liquidity.

Liquid Assets Ratio

Ogilo and Mugenyah (2015) include the liquid assets ratio as an independent variable and the result of multiple regression analysis indicated that the ratio of liquid assets has a negative and significant influence on liquidity risk. The study purely bases on bank-specific determinants and recommended for future research on macro variables. To verify the result of the Regression Analysis of variance use at 5% level of significance. This study concluded after the ANOVA test that the ratio of liquid assets significant factor. So, the manager has to need to focus on this variable to minimizing or control on risk. Jasienei, Jonas, Flimonea, and Grazina (2012) indicated that the nature of banks assets in the form of the inclination to transforming them into cash or very liquid assets affects its liquidity risk. Because a bank has to acquire the liquid funds might be sold the quickly liquid assets. The bank has the option to hold the liquid assets as a guarantee for getting the liquid funds. The degree of risk might be minimizing to keep the liquid assets. Yet, this might be not the case for all the banks due to the difficulty in selling or collateralizing their liquid assets. As a result, in order to find out the degrees of liquidity of each bank's assets, the liquid assets categorized into either risky liquid assets or less risky liquid assets after which everyone is divided by the standardization of full amount of assets of the bank. Liquid assets having a low risk include the liquid assets such as cash and bank balances, treasury bills and monies owed from other banks, other short-term government securities that can be a sale with the tiny price of risk and the diminutive transaction fee and with no trouble passes for security as well. Alshatti (2015) studied and conclude the findings of the research indicated that an increase in liquid assets ratio results in a reduction in the prosperity of commercial banks.

Capital Adequacy Ratio

Wekesa (2017) point out about the financial strength of the bank calculated with the capital adequacy. Financial power strong means the bank has the talent to hold up the operational expenses and control on liquidity funds. This study suggests that is mandatory for the banks to follow the regulatory instructions about the requirement of the minimum capital required. The least amount of required capital helps the banks to maintain their system effectively. The ratio of core capital to customer deposits as the measure of capital adequacy to be a significant determinant of liquidity risk. The Capital adequacy ratio also specifies the capacity of the bank to commence another new business. Financial flexibility for the banks explained through the size of the capital. The financial institution’s fluctuation in financial condition could be evaluated with the capital. Banks with high capital ratio have a tendency to experience lesser probability of liquidity risk. When the bank faces the crisis to hold up the loss bank used the inner power known as the capital adequacy ratio. When the bank in disaster condition, then the ratio of the capital adequacy directly related to the flexibility of the bank (Hakimi, 2017).

The study used the capital adequacy ratio in bank-specific factors as an independent variable to measure the liquidity risk and concluded that this variable had a positively influenced on liquidity risk. Forty-five banks included for a period of twelve years. Panel data regression analysis, the Hausman test technique used for analyzing the data. As a proxy capital adequacy, Tier-1 had been used. The capital adequacy ratio, which is a proxy for the rate of capitalization in a bank founded that to increase the level of liquidity reserve, as a result, the banks should preserve a strong capitalization because it assists in pervade additional cash in their balance sheet (Dutta & J, 2018).

Non-Performing Loan

The loans that mature in three months and at the time of maturity bank not in a position to meet the liability according to the agreement between the bank and customer to pay the actual amount with the interest on this amount are known as non-performing loans. For the growth of the economy if the ratio of NPLs high that creates a negative effect on banks (Lestari, 2018).

According to Zhang, Kutan, and Dickinson (2016) briefed about the non-performing loan and the draw the conclusion that the risk of lending increased with the increase in NPLs ratio. Whereas, the quality of the loan decrease when the ratio of NPLs increased. The financial system of the banks could not be stable in this condition. So, there is a need for an indicator to control the NPLs loans. Develop the plans to monitoring the NPLs loans. With the regular specified interval policies of NPLs must be reviewed. According to this research the relationship with the non-performing loan and behavior of the bank negative. Banks take a careful decision on performing the lending actions (Cucinelli, 2015; Lestari, 2018).

Leverage

Vazquez and Federico (2015) concluded that the structure of liquidity of the bank not strong and the ratio of leverage high before financial disaster than the chances of failure of the banks higher. Leverage was calculated by the proxy of Total bank debt to equity. The data used in the study to draw the results were secondary. The researcher applied the ARIMAX regression technique to analyze the liquidity risk performance. The end result showed that leverage had a positive association with the liquidity risk. Increase leverage very risky action as it may harm the capital and liquidity position. However, improving leverage also increase the return for shareholders (Mongid, 2015).

The results concluded the study conducted by Wisdom et al., (2018) measured the leverage ratio as an independent variable by total shareholders fund to total assets. The researcher concluded the study that leverage had a negative effect on the performance of the bank. The leverage showed statistically significant.

The literature shows the importance of liquidity risk in commercial banks and the results of studies. Keeping in view the literature it can be concluded that many studies conducted in different countries on determinants of liquidity risk, some research done with specific factors and other used the macro economic factors, whether some studies used both factors jointly in research by using the different types of analysis techniques. The foundation of this research will depend on three theories: inventory theory of capital and liquidity buffer, and shiftability theory, anticipated income theory that support research model.

The figure for theoretical framework has been drawn on to have precise understating of the variables of the study.

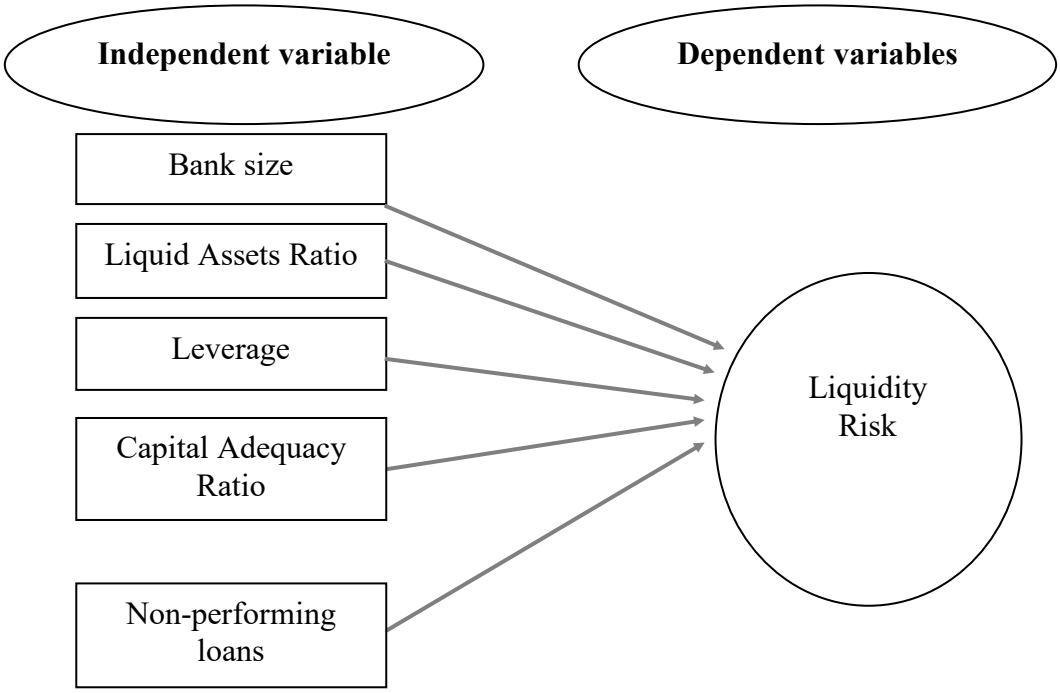


Figure 3.1 **Schematic diagram**

The hypotheses of this study are:

H_1: The size of banks has a significant effect on liquidity risk.
H_2: The liquid assets ratio has a significant effect on liquidity risk.
H_3: The leverage has a significant effect on liquidity risk.
H_4: The capital adequacy ratio has a significant effect on liquidity risk.
H_5: The Non-performing loan has a significant effect on liquidity risk.

RESEARCH METHODOLOGY

This study is based on a quantitative study which is used to examine the relationship and effect of liquidity risk on other determinants. The population of the study consists of banks in Pakistan. The sample of this study is based on commercial banks in Pakistan. Just those banks will be chosen whose information easily accessible. So, the total 20 commercial banks include that are listed in Pakistan stock exchange in the sample of study to investigates the effect. The data collected for this research is secondary nature. The data is available from the websites of each bank. Annual reports downloaded from state bank of Pakistan official website and also from banks websites. The time covered for this study is eight years 2012-2020.

Analysis of Data

For this research the analysis of panel data will be performed. Past studies show that analysis of Panel data used to examine the determinants of liquidity risk (Sawada, 2010).
To check the effect of independent variables (SOB, NPL, LAR, LEV, CAR) on the dependent variable (liquidity ratio) the regression analysis applied. The result of the regression model is given below:

Table 1: Analysis of Regression model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.314398	0.430459	5.376578	0.0000
LOG_SOB	-0.918150	0.203742	-4.506438	0.0000
LOG_NPL	0.014930	0.015063	0.991180	0.3232
LOG_LAR	-0.106535	0.032722	-3.255792	0.0014
LOG_LEV	0.101597	0.019039	5.336294	0.0000
LOG_CAR	-0.142732	0.029506	-4.837423	0.0000

This table represents the LOG_SOB, LOG_NPL, LOG_LAR, and LOG_LEV, LOG_CAR, as independent variables and LDR represent the dependent variable. Log of the full amount of bank's assets, the ratio of NPLs loans / total loans, liquid assets (cash and cash equivalents) to total assets, and total shareholders fund / total assets, core capital divided by total customer deposits, were regressed on total loan and advances to total deposits of customer respectively. Using these coefficients a regression as follow:

$$LR_{it}=\beta_0+\beta_1 LOG_CAR_{it}+\beta_2 LOG_LAR_{it}+\beta_3 LOG_SOB_{it}+\beta_4 LOG_LEV_{it}+\beta_5 LOG_NPLs_{it}+\varepsilon_i$$

LR=2.31-0.142CAR-0.106LAR-0.918SOB+0.014NPLs+0.101LEV

The results of regression analysis shows that all other variables except NPL has significant relation with liquidity risk.

Table 2: Model Summary

Model	R-squared	Adjusted R-squared	S.E. of regression	Prob. (F-statistic)
	0.451259	0.433442	2.572152	0.0000

This table provides a summary of the results of the regression. The value of R-squared is 0.451259 which means that 45.12% variation in liquidity ratio is explained by variables jointly. Adjusted R-squared is used in those researches where more than one independent variable included in the study. The adjusted R-square is a customized adaptation of R-squared. The many predictors adjusted in a model with the help of adjusted R-square. The adjusted R-square must be lesser than R-square which is 43.34%.

The most admired method that commonly uses in the analysis of the panel data is the fixed-effect regression analysis and the random-effect regression analysis. To check the effect of variable fixed effect method used when variables change with the passage of time. Within an entity when the relationship examined among the independent variables fixed effect regression model used. The independent variable feasibly affected by those factors having its own separate trademark. In panel cross-sectional unit might have different intercept but in fixed regression effect model having a constant slope of coefficients.

For this study the equation is:

$$Y_{it}= \beta_1 + (X_{it}) + A_i + u_{it}$$

Y_{it} : Regressand variable, where (i) shows entity, and (t) shows time
X_{it}: Regressor variable
β_1: Coefficient
u_{it}: residuals term

The equation for the fixed-effect regression analysis model of this study is as follows:

$$LR_{it}=\beta_0+ \beta_1 CAR_{it} + \beta_2 LAR_{it} + \beta_3 SOB_{it}+ \beta_4 LEV_{it}+ \beta_5 NPLs_{it}+ e$$

Unlike the fixed effect models, the variety crosswise over element is thought to be arbitrary and uncorrelated with the indicator variable incorporated into the model. The random effect model considers the cross-section unit and also the variation within the cross-sectional unit in the model. For this study the equation is:

$$Y_{it}= \beta_1 + (X_{it}) + A_i + u_{it} + \varepsilon_{it}$$

Y_{it} : regrassand variable where i= entity, t= time
X_{it}: regressor variable
β_1: Coefficient
u_{it}: Error term of the bank at the time, or between bank errors
ε_{it}: The error term having constant variance and zero mean

The random effect model equation for the study is as follows:

$$LR_{it}=\beta_0+ \beta_1 CAR_{it} + \beta_2 LAR_{it} + \beta_3 SOB_{it}+ \beta_4 LEV_{it}+ \beta_5 NPLs_{it}+e_{it}$$

To decide that either fixed effect regression analysis or random effect regression analysis model is used, the test of the Hausman is useful in this confusing situation.
The acceptance and rejection criteria of fixed effect regression analysis model and random effect regression model are the hypothesis of this test.

H_0: The random effect regression model is suitable.
H_1: The fixed effect regression model is suitable.

The outcomes after the application of the Hausman test in this research specify that the probability value of the Hausman test is less than 5%. So, the null hypothesis is not accepted and concludes that the fixed effect regression model is suitable for this research. The random effect regression model is fitted if the sample from the population is selected randomly. On the other hand, the fixed effect regression model is preferred when the sample from the population selected entirely (Brooks, 2008). In this research, the results show that the fixed effect regression model is more appropriate for this study. Brooks (2008) fixed effects model is preferred which is also suggested by the results of the Hausman test.

CONCLUSION AND FINDINGS

The impact of determinants of liquidity risk on commercial banks of the banking sector of Pakistan empirically examines in this research. This study is covering the period from 2012 to 2020. The hypothesis of this research is to evaluate the level of significance of determinants of

liquidity risk. The purpose of this study is to investigate the impact of determinants of liquidity risk on commercial banks of the banking sector of Pakistan by following its research objectives and the sample take for this research is 20 commercial banks from banking sector of Pakistan. The conclusion of Hausman test of the study found leverage has a significant and positive effect on liquidity ratio and the result of this research support to the study hypothesis which means bank face the high liquidity risk when the ratio of leverage is increased. The leverage and the liquidity ratio are positively associated with each other. These findings supported by (Ogilo and Mugenyah, 2015; Vazquez and Federico, 2015) whereas, the study conducted by Anh (2015) conflict on a positive relationship between liquidity risk and leverage. However, if the ratio of leverage is higher it will be beneficial for the shareholder of the bank in profit. The research discovers the size of bank has a negative and significant association with the liquidity ratio of the banking sector and these findings also supported by other studies conducted on the size of bank as an independent variable with liquidity risk as a dependent variable from (Zaighoudi & Hakimi, 2017; Mohammad, 2016; Choon & Hooi, 2015). This conclusion nonetheless deviates from other studies (Chagwiza, 2014; Fredrick, Jeremiah, & Onsomu, 2018; Ebenezer, 2016) which means if the size of bank increases the liquidity ratio decrease. So, it is concluded that a bigger bank has a low liquidity risk and vice versa. Another negative and insignificant relationship found among NPLs loan with liquidity ratio and also not support its research hypothesis due to an insignificant relationship, which means when the NPLs loan ratio raises liquidity ratio is decreased. The study conducted by (Johannes and Sheefeni, 2016; Murithi, 2014; Cucinelli, 2015) support this study results. Banks face a low risk of liquidity when they have a stock of non-performing loans. It is concluded that liquid assets ratio has negatively and significantly correlated with liquidity ratio that is supported by other studies conducted take liquid assets ratio as an independent variable (Ogilo and Mugenyah, 2015; Alshatti, 2014). This means when liquidity assets ratio increases the liquidity ratio decrease which is beneficial for the banks because the bank has stock of assets which is used in case of emergency. The research discovers the capital adequacy ratio has negatively and significant effect on liquidity ratio. This supports the findings of (Choon and Hooi, 2015; Leykun, 2016; Chagwiza, 2014; Shah, Khan, Ali, and Tahir, 2018). This conclusion also supports the hypothesis of this research. If the capitalization level increases it will be beneficial for the bank because the bank has fewer chances to face the risk of liquidity. When the capital amount increases the banks have the ability to face the liquidity risk so, the liquidity ratio decrease.

RECOMMENDATION

This study recommends for the managers of Commercial banks in Pakistan, to consider and control the capital adequacy, liquid assets ratio, Non-performing loans, size and leverage collectively to minimize the level of liquidity risk of the banks.

LIMITATIONS

The study relied on data from published financial reports which are based on the judgments of managerial level. Accordingly, the findings of this research mainly affected by the quality of information reported in the financial statements of commercial banks. In addition, the macroeconomic factors that might be influenced on the liquidity risk have not been captured by the study.

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ANNEXURE

Annexure 1. *Hausman test*

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	13.720975	5	0.0175

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
LOG_SOB	-0.792947	-0.978817	0.062706	0.4579
LOG_NPL	-0.035343	-0.025707	0.000025	0.0537
LOG_LAR	-0.030849	-0.067200	0.000424	0.0775
LOG_LEV	0.025543	0.039824	0.000032	0.0113
LOG_CAR	-0.106902	-0.115871	0.000188	0.5130

Cross-section random effects test equation:
Dependent Variable: LR
Method: Panel Least Squares
Date: 08/13/20 Time: 19:00
Sample: 2012 2020
Periods included: 8
Cross-sections included: 20
Total panel (balanced) observations: 160

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.997735	0.762285	2.620720	0.0098
LOG_SOB	-0.792947	0.385762	-2.055536	0.0418
LOG_NPL	-0.035343	0.014762	-2.394244	0.0180
LOG_LAR	-0.030849	0.040067	-0.769915	0.4427
LOG_LEV	0.025543	0.018113	1.410211	0.1608
LOG_CAR	-0.106902	0.034082	-3.136565	0.0021

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.796363	Mean dependent var	0.615485
Adjusted R-squared	0.760161	S.D. dependent var	0.171698
S.E. of regression	0.084086	Akaike info criterion	-1.971344
Sum squared resid	0.954519	Schwarz criterion	-1.490848
Log likelihood	182.7075	Hannan-Quinn criter.	-1.776231
F-statistic	21.99774	Durbin-Watson stat	1.212147
Prob(F-statistic)	0.000000		

Annexure 2. *Sample of the study*

Serial no.	List of commercial banks
1	Bank of Khybers
2	Allied Bank Limited
3	Askari Bank Limited
4	Bank Al-Habib Limited
5	Bank Alfalah Limited
6	Bank islami Pakistan Limited
7	Bank of Punjab
8	Faysal Bank Limited
9	Habib Bank Limited
10	Habib Metropolitan Bank Limited
11	JS Bank Limited
12	MCB Bank Limited
13	Meezan Bank Limited
14	National Bank Pakistan Limited
15	Samba Bank Limited
16	Silkbank Limited
17	Soneri Bank Limited,
18	Standard Chartered Bank (Pakistan) Limited
19	Summit Bank Limited
20	United Bank Limited