The Effect of Liquidity Risk Management on Financial Performance of Commercial Banks in Pakistan

Alim, Wajid and Ali, Amjad and Metla, Mahwish Rauf

Lahore School of Accounting Finance, University of Lahore, Lahore, Pakistan, European School of Administration and Management (ESAM), France. Lahore School of Accounting Finance, University of Lahore, Lahore, Pakistan, Lahore School of Accounting Finance, University of Lahore, Lahore, Pakistan

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Wajid Alim

Lahore School of Accounting & Finance, University of Lahore, Lahore, Pakistan

Amjad Ali

European School of Administration and Management (ESAM), France

Lahore School of Accounting & Finance, University of Lahore, Lahore, Pakistan

Mahwish Rauf Metla

Lahore School of Accounting & Finance, University of Lahore, Lahore, Pakistan

Abstract

The study tests the effect of liquidity risk management on the financial performance of commercial banks in Pakistan. Pakistani financial market is heavily dependent on its banking sector to achieve its financial goals and stability. Therefore, the banking sector's performance has a significant effect on the overall economy of the country. To achieve its need for stability, the central bank of Pakistan ensures that banks maintain an optimum liquidity position to reap the most benefits and increase returns. In this study, the effect of liquidity risk management on financial performance is studied using panel data for Ordinary Least Square analysis. Financial data of all commercial banks operating in Pakistan during the period of study was taken from the year 2006 to 2019 using data archives of the State Bank of Pakistan website. It is concluded that higher liquidity increases banks' performance in commercial banks of Pakistan. The results are in line with several studies and available literature. This study can become a good reference for future policy decisions regarding the minimum liquidity requirements of banks in this region. This study can be further enhanced using a longer period of study and include more variables specific to the banking sector in Pakistan, like bank size, age of bank, etc. Further studies may include other non-commercial banks to further strengthen the study and increase its reliability.

Keywords: Liquidity Risk; Performance; Banking Sector; ROA; ROE; Pakistan.

INTRODUCTION

The main goal for any profit-making business, including the banking sector, is to maximize its returns through its business operations. Banks operate and strategize to achieve this goal of profit maximization and increased returns. They find lucrative investment opportunities

that can enhance their income and thus increase their performance. Simultaneously, they also work on risk minimization strategies to reduce the chances of failure in any of their endeavors that may impede their performance. Therefore, although, banks look for favorable investments to increase their profit ratios, they also take equal measures to ensure risk minimization in all their operations.

Risk management has always been a priority item in a bank's itinerary. Banking companies undertake various kinds of financial risks to provide financial solutions to their clientele. Hence, they play a pivotal role as agents to provide knowledge of any market, funding capacity, and efficiency in their financial operations. Due to this important role, banks usually occupy a prime position in such transactions (Santomero, 1997). Thus, despite some crises from time to time, the banking industry has always been a vital agent in human welfare and economic development.

Banks are a facilitator to provide funds liquidity solutions to their clients. To achieve this goal, banks, sometimes use their equity to absorb risks and to facilitate transactions (Santomero, 1997). Therefore, banks act as agents to facilitate financial activities among different industries of a country. Thus, the performance of the banking sector of a country plays a vital role in the gauged financial performance of a country itself (Munir et al., 2012).

The main operation of a bank is to smooth the flow of cash between its lenders and depositors. As per the classical point-of-view, the banking sector deals in the flow of cash to and from people in the form of custodians or lenders. Therefore, liquidity is the first thing that banks take into account at the time of their establishment (Hakimi & Zaghdoudi, 2017). Liquidity risk can be described as a state when a bank is not able to meet all the depository needs of its customers partially or completely for a period of time (Jenkinson, 2008). Such a state of affairs for a bank is a red alarm as it may signal the market quite negatively which would, in turn, affect the share price, and eventually its profitability. There can be many reasons for liquidity risk in a banking company. Liquidity risk can be caused if short-term liabilities are funded from long-term assets, which may result in a refinance of that short-term liability. Banks have advanced risk management systems in place which enables the banks to pay off their liabilities when they become due, thus reducing the chances of cash blockage and eventually liquidity crunch (Kumar & Yadav, 2013).

Another reason for liquidity risk can be an increase in interest rates. Bank is basically a channel for lending to businesses. The banking sector liquidity risk increases if there is a monetary contraction and banks have to reduce their lending. As a result of reduced lending,

investments in the economy also reduce, thus decreasing the overall economic activity (Igan et al., 2013). A bank with a better liquidity position might face less liquidity risk and be able to lend even under minor contraction in the monetary policy. So, a bank with better liquidity position has a better shock absorption power of monetary policies as compared to a bank with lower liquidity ratio (Kashyap & Stein, 2000). Therefore, banks need to be able to find an optimum level of liquidity to be able to manage its affairs smoothly while being able to keep its sovereignty.

A major responsibility of banks, being the source of liquidity for its clients, is to be able to manage liquidity themselves. The banking channel being a central place for flow of cash flow in an economy has to manage both liquidity creation and liquidity risk. Banks create liquidity by dislodging liquidity blockages for businesses by providing financing. Meanwhile, it also takes care of its own liquidity risk created due to issuance of a lot of loans (Vossenand & Ness, 2010).

In order to avoid any liquidity crisis, central banks and regulatory authorities take strict action to maintain a certain level of liquidity. The banks are liable to maintain a level of liquidity as per requirements of central banks (Nasir et al., 2021; Haider and Ali, 2015; Kassem et al., 2019; Roussel et al., 2021; Sajid and Ali, 2018; Senturk and Ali, 2021; Ali and Naeem, 2017; Ali, 2011; Ali, 2015; Ali, 2018; Ali and Bibi, 2017; Ali and Senturk, 2019). As a regulatory authority over all banks operating in Pakistan, State Bank of Pakistan has required all banks to maintain a weekly average of minimum 5% Cash Reserve Requirement (CRR) of its total demand liabilities as per its DMMD Circular No. 4 of 2018 issued by the Domestic Market & Monetary Management department of State Bank of Pakistan. Furthermore, the daily average for CRR cannot go below 4% (State Bank of Pakistan, 2018).

Policymakers all over the world are suggesting that the banking sector must maintain more liquid assets as compared to the past to hedge against any liquidity crisis. It has led to an international discussion on what can be the standard measures that should be taken and what should be standards to avoid liquidity risk (Basel Committee on Banking Supervision, 2014). It is important to note that liquid assets, such as cash in hand and cash reserves with the central bank, are usually less profitable and yield lower returns thus increasing the opportunity costs for banks when they maintain these at a greater level. Therefore, banks try to maintain only the minimum amount of liquid assets that are enough for their smooth operations and which do not impede their performance. Therefore, it comes up to central banks to create a framework and regulations to ensure a certain level of liquidity position of

banks to avoid dangerous levels of liquidity risk (Mwangi, 2014).

Liquidity position and bank's performance can be measured by various financial ratios such as Return on Assets (ROA), Return on Equity (ROE), Current Ratio, Quick Ratio, and Net Interest Margin (NIM), etc. (Murthy & Sree, 2003). There have been a lot of studies on the effect of credit risk on bank's performance. However, in the past few years, liquidity risk is also studied as a vital factor that affects a bank's performance. There have been some studies on the relationship of liquidity position on performance (Claeys & Vennet, 2008; Trujillo-Ponce, 2013). The results have been quite varied. Some researchers have found a significant relationship between the two variables. They are of the view that a decrease in liquidity risk positively affects a bank's performance (Bourke, 1989; Graham & Bordeleau, 2010Lartey et al., 2013). However, some have found the opposite to be true (Konadu, 2009). Furthermore, there are some studies that do not find any significant relationship between the two variables (Lamberg & Valming, 2009; Li, 2007). The difference in results in all these studies is because the effect varies from region to region and in different time periods. Moreover, different variables may have been used to study the effect of liquidity risk on a bank's performance. Performance is studied through different variables by different researchers. Alzorqan (2014) has used Return on Assets and Return on Investment to study banks' performance in Jordan. On the other hand, Rahman and Saeed (2015) have used Return on Assets and Return on Equity to study banks' performance in Malaysia. Hakimi (2017) has taken Net Income Margin as a measure of banks' performance in Tunisia. Similarly, different units of measures are applied by different researchers to evaluate liquidity position of banks. Loan to deposit ratio, liquid assets to total assets ratio, assets quality, and many more are used to evaluate liquidity position (Chowdhury & Zaman, 2018, Hakimi & Zaghdoudi, 2017; Ferrouhi, 2014). Mwangi (2014) has claimed that the effect of liquidity on performance may also depend on business model of the bank and the difficulties faced by the market where these banks operate. This can also be a gap to be filled by further studies on this topic. Business models and macro environment considerations may make this model more authentic. This study takes into account all the commercial banks operating in Pakistan during the period of this study. Their business techniques are also taken into account. Ratio of non-performing loans and their approach to liquidity position, depicted by ratio of liquid assets to total assets and total deposits respectively, are taken into account to capture the essence of business model of the bank.

The current study is based on the effect of liquidity risk on banks' performance in Pakistan. Banking is the only developed form of financial market in Pakistan and its performance

affects the country as a whole. The present work is important to bank regulators to make better decisions regarding portfolio management and risk diversification, taking into account, the cultural and financial constraints of this specific country.

This study contributes to the literature by analyzing the effect of liquidity risk on the performance of banks all over Pakistan. The present study would enable the regulators to forecast the effect of their liquidity position on the profitability of banking industry in Pakistan. This will be helpful in analyzing the optimum percentage of liquidity that needs to be maintained by banks of Pakistan without foregoing any opportunity cost on liquidity assets held in reserve. Similar studies have also been conducted in Kenya, Bangladesh, Iran and Jordan to enable regulators to make better decisions with respect to their specific regions, (Mwangi, 2017; Chowduhry & Zaman, 2018; Tabari et al., 2013; Alzorqan, 2014. The results have shown that an increase in liquidity has a negative effect on banks in Kenya and Bangladesh, (Mwangi, 2017; Chowduhry & Zaman, 2018). However, the results for liquidity management are positive for Jordan and Iran (Alzorqan, 2014; Tabari et al., 2013). As the results for different regions show a lot of variation, a separate is required for Pakistan to know the effect of liquidity on performance in banks in this region. This study contributes to literature by emphasizing the pros and cons of maintaining liquidity by banks in Pakistan after considering the environmental factors and industry norms of banking in Pakistan.

An increase in liquidity decreases liquidity risks and gives provides banks a cushion for shock absorption in times of crisis. On the other, banks incur opportunity cost as they lose business on the funds held to achieve a certain level of liquidity. Therefore, banks need to find the balance between whether an increase in liquidity gives them more profit through avoidance of risk, or it is a source of business losses, (Mwangi, 2017). The study helps banks in Pakistan to be able to study the effect of an increase in liquidity by considering the variables specific to the Pakistani market and its banking industry.

Although there is an extensive study on the impact of liquidity position and liquidity risk on performance of banking sector in many countries, the results have been mixed for different regions, (Chowduhry & Zaman, 2018). Different regions produce different and entirely varied results. So, it can be inferred that region may affect the variables to a much greater extent. The results have shown that an increase in liquidity has a negative effect on banks in Kenya and Bangladesh, (Mwangi, 2017; Chowduhry & Zaman, 2018). However, the results for an increase in liquidity are positive for Jordan and Iran (Alzorqan, 2014; Tabari et al., 2013). Therefore, the results of studies conducted in other countries may not be a good basis for similar results in Pakistan. In fact, the regulatory and institutional environments may be

very different and other characteristics specified to this country can be a big reason not to adopt research in other countries as a pretext of similar results in Pakistan. Therefore, a similarly comprehensive study to analyze the effect of liquidity risk on Pakistan banks' performance needs to be conducted. Although Arif and Anees (2012) did analyze the effect of liquidity risk on banks' performance in Pakistan, their sample size included only lesser number of banks and different criteria to measure performance of banks. The current study takes into account all the commercial banks operating in Pakistan during the full currency of the study period.

The study takes into account the specific factors related to banking sector in Pakistan. Pakistan faces a dire issue of no liquid backup assets against its loaning and this study sheds light on the direness of financial situation of this country so that measures could be taken to resolve the liquidity crisis this country is facing. This study would be helpful for regulators to devise strategies considering the acute scarcity of resources in Pakistan. This research can be a landmark to study similar variables in other parts of the world, especially where banking reforms are still in their developmental stage, like Pakistan. The study can be further developed by including more macro-variables to further increase the reliability of the study.

LITERATURE REVIEW

Economy of any country is greatly dependent on the health of its financial sector. Emerging economies, like that of Pakistan, do not have a very well-developed stock market or money market. Therefore, the banking sector bears all the responsibility of running a stable financial sector. Therefore, performance of banks has a huge impact on the performance of economy as a whole in emerging markets, like Pakistan. Banks need to look for good investment opportunities to boost their performance. Simultaneously, they need to safeguard their existing portfolio against any setbacks or liquidity or financial crisis.

There has been a lot of focus in the past few years on the risk management of banking industry. Risk management can be defined as the procedure that a bank adopts to manage the uncertainty in its financial exposure. Risk management is executed through a number of steps that include identification of risk, assessment, monitoring and control (Bikker and Metzmakers, 2005; Buttimer, 2001). According to researchers, an identified risk is less dangerous than an unidentified risk. Risk can have many dimensions and is often linked with other aspects of daily operations. So instead of dreading its existence risk should be managed (Jorion, 2009).

Banks focus on their more risk-prone areas and build strategies to counter the risk in those areas. Risk managers are continuously trained to develop their skills to identify and mitigate risk. Therefore, banks have specialized risk management frameworks to analyze and reduce the level of risk (De Juan, 1991).

The focus and control measures for any type of risk depends upon its complexity (Ramos, 2000). Although risks cannot be avoidable, banks take an intelligent risk and manage quite well (Kithinji, 2010). Financial institutions, like banking companies are prone to an assortment of risks which include credit risk, interest rate risk, foreign exchange risk, market risk, political risk and liquidity risk (Cooperman et al., 2000Yusuf, 2003). The current study focuses on liquidity risk of the banks and its pros and cons faced by the banks in Pakistan. Banks need to focus on bringing maximum utilization of their assets while maintaining a safe position for any unforeseen financial shock. Thus, liquidity position is a very critical value to be determined by the banks while keeping in mind both sides of the picture, the profit maximization and loss minimization sides.

As banks are a business of money, liquidity risk is faced by the banks due to availability of liquid assets and cash to run their operations. Money, in the form of liquid assets and pure purchasing power, is necessary to finance expenditures and as a cushion for any future uncertainty. However, when it comes to banking sector, high liquid assets in the form of cash mean low returns and increased opportunity costs for holding money. So, if not otherwise mandated by the regulatory authority, banks may not keep a lot of liquid cash. However, another reason to hold cash is that it ensures stability of the financial system (Chowdhury & Zaman, 2018).

There are a number of factors that determine the financial performance of a bank. Some of them are macro factors that are same for the whole industry. However, their effect on bank to bank varies due to how established a bank is. The macro factor includes country-wide factors of progress like GDP, inflation, rates of interest, or political conditions of a country. If the GDP is growing, the profitability is positively affected. Similarly, periods of boom in business cycles and political stability also affect the banks in a positive manner (Athanasoglou et al., 2006). Other factors include the micro factors that vary from bank to bank. This may include capital adequacy, assets quality, management efficiency, and liquidity management. A high capital adequacy ratio means that the bank has enough resources to fund its investments. Thus, the bank has much cushion to bear losses and unforeseen market shocks. This may give it a safety net for investments that may be risky but more profitable (Ayele, 2012; Ongore & Kusa, 2013). Furthermore, the quality of assets

has a direct effect on bank's performance. A high ratio of non-performing loans is the biggest risk a bank can face (Dang, 2011). A good management performance ensures low operating costs and thus an increase in overall performance (Ongore & Kusa, 2013).

Liquidity management is a very important factor that determines the performance of a bank. Adequate liquidity, i.e., the ability of a bank to fulfill the obligations of its depositors, is positively proportional to the bank's profitability (Dang, 2011). So, banks need to maintain appropriate levels of liquidity in order to be profitable. Liquidity can be measured through a number of ratios, among which total deposit to total assets and total advances to total assets are the most common ratios (Ongore & Kusa, 2013).

There have been a number of studies on the effect of liquidity risk on the performance of banks throughout the world. The results of all these researches have been quite varied. Many researches such as those executed in the banking sectors of Iran, Europe, Tunisia, South Africa, Malaysia and other regions show promising performance with an increase in liquidity position (Cuong Ly, 2015; Tabari, Ahmadi and Emami, 2013; Hakimi, Zaghdoudi, 2017; Mamatazakis & Bermapi, 2014; Marozva, 2015). Even some researchers have found no relationship between the two variables (Konadu, 2009). However, some studies in regions like Jordon have found mixed results for these variables (Alzorqan, 2014; Olagunju, David and Samuel, 2012). Olagunju et al. (2012) believed that both too much and too little liquidity can be fatal for any bank. However, a number of studies found that a stable liquidity position decreases the performance of banks in Canada, America, Nigeria, Jordan, Nepal, Turkey and Switzerland (Agbada & Osuji, 2013; Alper & Anbar, 2011; Bourke, 1989; Ferrouhi, 2014; Ibe, 2013; Graham & Bordeleau, 2010; Musiega, Olweny, Mukanzi & Mutua, 2017; Neupane & Subedi, 2013; Nimer, Warrad and Al Omari, 2013). The results of a study of these variables have produced quite varied results in different regions, so it can be concluded that regional diversity and specific macro factors of an economy may affect the variables greatly. Therefore, a need arises to study the effect of liquidity on banks' performance specific to this region, i.e., Pakistan. It will enable the regulator to formulate policies and manage risk based on the specific characters of this region keeping in mind the macro environment of Pakistan.

There are a number of theories that determine some insight as to the ratio of liquidity that must be maintained by the banks. The most common are the Shiftability theory and Liquid Management theory.

Shiftability Theory says that bank's liquidity position can be maintained if it holds assets

that can be readily converted into cash or sold for cash. It can further be detailed that in order to ensure liquidity of a bank, the bank should always have assets that can be offered or discounted to cash. Therefore, marketable securities held by the bank are a good source to increase liquidity position.

The liquidity management theory maintains that bank may not need to maintain high liquid assets on its balance sheet at all times as it can always purchase funds from the market when required. This theory is not very well received by many researchers as they claim that during the period of low profits and low business, banks may not be able to find the required liquidity as creditworthiness may be low and market confidence may have shaken. However, for established banks the liability side of the balance sheet, i.e., deposits and other creditors, may be a source of liquidity (Nwankwo, 1991).

THEORETICAL MODELS

Different models have been used to study the effect of liquidity risk on banks' performance. In many cases, net interest margin is used to calculate banks' performance by many researchers. Hakimi (2017) has determined a model to test a similar hypothesis that has taken into account the external factors affecting the study. The model is as follows:

$$NIMi,t = \beta 0 + \beta 1LIQRi,t + \beta 2CRDRi,t + \beta 3CAPi,t + \beta 4SIZEi,t + \beta 5HHIi,t + \beta 6GDPi,t + \beta 7INFi,t + £i,t \quad (1)$$

where NIM is the bank's performance, LIQR measures the liquidity risk, CRDR measures the credit risk, CAP is the capital adequacy ratio, SIZE measures the bank's size, HHI measures Hirshmen Herfindahl index, GDP is the variable for Gross Domestic Product and INF is the variable for inflation.

Another model used by Ibe (2013), which was also used later in other studies (Mwangi, 2012) to measure banks' performance with respect to liquidity is as follows:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon \quad (2)$$

where Y represents a return on assets, X1 represents liquid assets to total assets ratio, X2 represents liquid assets to total deposit ratio, X3 represents balance due to other banks to total assets ratio and X4 represents asset quality. Although Net interest margin has also been extensively used by many researchers like Adusei (2015) but a more effective and commonly used measure is to measure return on assets and return on equity to analyze performance with respect to liquidity. This is also used in several academic works (Doyran 2013). Bank's performance indicates how efficiently the bank's management of their

resources to increase income, (Chwodhry & Zaman, 2018). A higher value of liquid assets to total assets, or total deposits, indicates better liquidity in banks. Asset quality indicates how well the bank is able to manage its funds in terms of good quality loans.

MODEL & VARIABLE CONSTRUCT

We design our models based on the second model of Ibe (2013) and Mwangi (2012) as we do not require the effect of macro-variables as only one region is in consideration. Our models are as follows:

$$ROA = \beta 0 + \beta 1LIQA1 + \beta 2LIQD2 + \beta 3BTA3 + \beta 4LA4 + \beta 5AQ5 + \varepsilon \quad (3)$$

$$ROE = \beta 0 + \beta 1LIQA1 + \beta 2LIQD2 + \beta 3BTA3 + \beta 4LA4 + \beta 5AQ5 + \varepsilon \quad (4)$$

where ROA represents return on assets, i.e., ratio of after-tax profit to total assets, ROE represents return on equity, i.e., the ratio of after-tax profit to total equity, LIQA1 represents liquid assets to total assets ratio, LIQD2 represents liquid assets to total deposit ratio, BTA3 represents balance due to other banks to total assets ratio, LA4 represent Liquid assets that are calculated as a sum of cash in hand, SBP balances, T-bills and bonds minus balances due to other banks. AQ5 represents asset quality that is the ratio of non-performing loans to gross loans and advances. AQ5 is the liquid liabilities side of the liquidity position and is also determined through a ratio of demand deposits to total assets in some studies. Performance is measured through ROA and ROE and liquidity is measured through LIQA, LIQD and BTA. AQ and LA act as control variables. Multiple regressions are conducted through the Ordinary Least Squares (OLS) method to calculate the effect.

The variables detail is as follows:

Variables	Variable Construct	Methodology & Logic	Similar Studies
Bank performance [ROA]	ROA = Profit after Tax/Total Assets	Measured by the ratio of after-tax profit to total Assets	Cebenoyan & Strahan, 2004
Bank performance [ROE]	ROE = Profit after Tax/Total Equity	Measured by the ratio of after-tax profit to total Equity	Farooq et al., 2015
Liquidity risk [LIQD]	LIQD= Liquid Assets / Total Deposit	Measured by the ratio of liquid assets to total deposit.	Mwangi, 2014
Liquidity risk [LIQA]	LIQA= Liquid Assets / Total Assets	Measured by the liquid assets to total assets.	Chowdhury & Zaman, 2018 Cebenoyan & Strahan, 2004

Liquidity risk [BTA]	BTA= Balance due to other banks / Total Assets	Measured by the ratio of balance due to other banks to total assets	Farooq et al., 2015
Liquid Assets [LA]	LA= Cash in hand + SBP balances + T-bills and bonds - Balances due to other banks	Measure of liquidity	Farooq et al., 2015
Assets Quality [AQ]	AQ= NPL / Total Advances	Measured by the ratio of non-performing loans to total gross advances	Kithinji, 2010

Return on asset and Return on equity are the most popular measures to evaluate the performance of a bank or any other business. Other measures include the ratio of interest margin to total assets.

Liquidity risk and credit risk are important factors to be analyzed when considering the overall risk. Liquidity risk is calculated as a ratio of liquid assets to total assets. An increase in this ratio depicts an increase in liquidity position and vice versa. Increased liquidity position means that a bank is in a much better position to grant loans. If the liquidity position is low, then the bank faces liquidity risk, i.e., if depositors wish to withdraw funds, bank may not have enough liquid cash to cater to their needs. Liquidity position as a ratio of liquid assets to total assets has been used in many previous studies (Fiordelisi & Mare, 2014; Hakimi & Zaghdoudi, 2017; Rose & Hudgins, 2008; Trujillo-Ponce, 2013).

The quality of its advances portfolio has a great impact on its overall profitability. According to Dang (2011), the highest risk that a bank faces is the losses occurring from bad debts.

DATA SAMPLE

The study is based on financial information consolidated data of listed banks in Pakistan in the Pakistan Stock Exchange and State Bank of Pakistan database for a period of 14 years from 2006 to 2019. In order to keep the study more in line with its purpose and to scale out unnecessary factors, the sample data includes only commercial banks and does not include development banks, saving banks, mortgage banks, and co-operative banks, etc. The study includes only those banks that have been operational during the complete period under study. Panel data for 25 banks for a period of 14 years is used to study the concept. Ordinary Least Square method (OLS) is used to analyze data.

GMM can also be a good method to analyze this data as it could have resolved any issued of

heterogeneity in the data. In the banking industry, the performance of last year greatly affects the performance of the current year. Therefore, in order to reduce the effect of heterogeneity, the GMM model can be used that is better able to interpret results in such cases. However, in the current study our constraint over the number of observations makes it impossible to use GMM. OLS is used owing to the fact that sample size is not very large and panel data is used whereas heterogeneity is not as big a concern as it is for time series studies. Further studies on this may be conducted using GMM if they can achieve the right sample size.

RESULTS AND DISCUSSION

The relationship of liquidity with bank's performance has garnered varied results through different regions and time periods. Therefore, an extensive study to determine their impact on the Pakistani market is required to formulate better policies for this region.

The analysis is conducted in the following manner. First, descriptive statistics is analyzed to get an overview banking statistic pertaining to this study. Secondly, correlation analysis shows the relationship between these variables. Thirdly, regression is run in order to study the effect of liquidity on bank's performance. Lastly, liquidity position is analyzed and a liquidity risk analysis is conducted.

DESCRIPTIVE STATISTICS

Descriptive Statistics of the banks over the years show the following results:

TABLE 1: DESCRIPTIVE STATISTICS

	ROA	ROE	LIQD	LIQA	BTA	AQ
Mean	0.032	0.127	0.119	0.574	0.114	0.343
Median	0.008	0.185	0.110	0.665	0.090	0.210
Maximum	0.350	1.000	0.750	1.000	0.530	1.000
Minimum	-0.710	-14.743	0.040	0.100	0.010	0.000
Std. Dev.	0.148	1.014	0.059	0.281	0.084	0.284

The table shows an overview of the performance position and liquidity positions of the banks in Pakistan. Pakistani banks have an average return on assets of 3.20%, with a variation of 14.80%. They have an average return on equity of 12.70%, with a variation of 101.40%. This shows that return on assets is a more stable ratio when forecasting the performance of banks in Pakistan.

CORRELATION ANALYSIS

The correlation analysis shows the direction of the relationship among variables.

TABLE 2: CORRELATION ANALYSIS OF VARIABLES

	ROA	ROE	LIQD	LIQA	BTA	AQ
ROA	1.000					
ROE	0.326**	1.000				
LIQD	0.0250	0.025	1.000			
LIQA	0.0432	0.0243	-0.433**	1.000		
BTA	-0.084	-0.079	-0.266**	0.103*	1.000	
AQ	0.126**	0.015	-0.049	0.040	-0.061	1.000

The * and ** show the significance level of 10% and 5%, respectively, for the given values.

There is a strong positive relationship between both variables for performance. If ROA increases, ROE also tends to increase. Similarly, liquidity ratios also show similar positive and significant trends. If the liquid assets increase, it increases both liquid assets to deposit ratio as well as liquid assets to total assets ratio. These ratios have a positive relationship with the performance ratios as well. If liquidity increases, the performance also tends to increase.

Both liquidity ratios have a significant direct relationship with the third liquidity risk ratio, balance due other banks to total assets. However, it has a negative, albeit insignificant, relation with performance ratios. Asset Quality has a significant positive relationship with Return on Equity but has an insignificant positive relationship with Return on Assets.

REGRESSION ANALYSIS

Regression analysis of ROA with liquidity ratios through OLS shows the following results:

TABLE 3: ANALYSIS OF LIQUIDITY RATIOS WITH PERFORMANCE MEASURES

	Return on Assets	Return on Equity
C	-0.094*	-0.007
	(0.041)	(0.033)
LIQD	0.163	0.363
	(0.159)	(0.276)
LIQA	0.077*	0.236
	(0.036)	(0.289)
BTA	-0.043	-0.931
	(0.110)	(0.886)
AQ	0.065*	0.025
	(0.033)	(0.265)
R2	0.171	0.013
F-stat	8.755	0.549
Prob. (F-stat)	0.000	0.738
DW Statistics	0.760	1.900

The * that the results are significant at 5% level of confidence. Values in parenthesis show the standard error of the coefficients.

The results show that a positive relationship of banks' performance in Pakistan with an increase in liquidity. The results show a positive relationship between ROA and LIQD, i.e., liquid asset to deposit ratio. Similarly, it shows a similar positive relationship between ROA and LIQA, i.e., liquid asset to total asset ratio. The results are significant at 5% confidence interval for LIQA. Relationship of ROA with BTA shows a negative result. BTA ratio shows a decrease in liquidity. Therefore, an inverse relationship between ROA and BTA further endorse our results that increase in liquidity positively affects ROA. Overall, the model describes our research up to 17.10%. Addition of more variables and increase in data sample can enhance its goodness of fit. F-stat show a good fit and significant model. Results are significant in case of ROA and show a positive relationship between liquidity and ROA for commercial banks in Pakistan.

Results show similar tendencies in relation to ROE as well. However, the results are not significant. LIQA and LIQD have a positive relation with ROE and BTA is negative. DW for ROE shows a satisfactory position of autocorrelation. Therefore, considering these results it is evident that liquidity has a positive effect of performance of commercial banks in Pakistan. Thus, our hypothesis that an increase in liquidity positive affects performance

of commercial banks in Pakistan is accepted.

LIQUIDITY RISK ANALYSIS

To get an overview of the performance of the banking sector with respect to its performance, we have analyzed our data through the following tables as well.

1. Evolution of Liquidity During the Years

Table 4 shows the evolution of liquidity during the years for banking sector in Pakistan.

TABLE 4: EVOLUTION OF LIQUIDITY DURING THE YEARS

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Liquid Assets / Total Assets	0.52	0.40	0.51	0.60	0.57	0.65	0.56	0.59	0.65	0.64	0.09	0.10
Liquid Assets / Total Deposit	0.14	0.13	0.13	0.12	0.12	0.12	0.09	0.13	0.11	0.10	0.12	0.14

The table describes the annual average liquidity risk position of Pakistani banks during the period of ten years. The liquidity risk ratio of liquid assets to total assets has decreased from the year 2008 to 2009 and has then started to rise till 2013. After 2013 it has been somewhat steady till 2017.

The liquidity risk ratio of liquid assets to total deposits shows a steady decline in liquidity from 2008 to 2014, with an increase again in 2015 and 2016.

2. Bank-wise Average Liquidity Position

In table 5, we analyze the bank-wise breakup of average liquidity risk (liquid assets to total assets) faced by banks during the years.

TABLE 5: BANK-WISE AVERAGE LIQUIDITY POSITION

FWB	NBP	SND	BOK	BOP	ABL	ASK	ABK	BAH	BAF	BISL	DIB	FBL
0.58	0.34	0.47	0.50	0.50	0.66	0.75	0.29	0.74	0.43	0.61	0.43	0.74

HBL	HMB	JS	KASB	MCB	UBL	SMB	SILK	SNRI	SCBL	SMIT	MZN
0.20	0.71	0.62	0.60	0.56	0.44	0.55	0.53	0.70	0.79	0.73	0.57

The table shows the bank-wise average liquidity during the year for each of the 25 banks in our sample separately. The data helps us to know which banks were more prone to liquidity risks as compared to the rest. The data shows that Habib Bank Limited (HBL) has the least amount of liquidity, followed by Al-Baraka Bank (ALBK) and National Bank of Pakistan

(NBP). Moreover, Standard Chartered Bank Limited (SCBL) has the highest liquidity as depicted by the comparable data available, followed by Bank Al-Habib (BAH) and Faysal Bank Limited (FBL). The average liquidity risk position stands at 0.56 for all banks during this period. From these statistics we can analyze that government holding may have a hand in affecting the liquidity position of a bank. National Bank of Pakistan is state-owned. Habib Bank Limited had been state owned previously which was later privatized. Similarly, UBL with a liquidity position of 0.44 was also converted from a government-owned to a private bank. Furthermore, these banks are big banks with huge asset sizes that may have an impact as their overall shock absorption power is greater due to their size and government backing. These banks, although now privatized, still have a great hold of government for their projects. Therefore, in order to cater to these projects, these banks sometimes have lax credit policies as compared to other banks. Therefore, liquidity risk increases and the ratio of liquid assets as compared to total assets decrease much more for these banks. Faysal Bank Ltd and Bank Al-Habib being smaller size private banks may have lesser shock absorption power due to their smaller total assets value and thus they value their liquidity position more in order to stay in the market.

3. Evolution of Performance of Banks During the Years

In table 6, we analyze the evolution of performance via Return on Equity of Pakistani banks.

TABLE 6: EVOLUTION OF PERFORMANCE OF BANKS DURING THE YEARS

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
-0.04	-0.68	-0.04	0.10	0.05	0.10	0.14	0.14	0.12	0.09	0.11	0.11

Performance of banks shows a dip in performance from 2008 to 2010. It has shown a steady growth till 2015 and again a dip in performance from 2016 to 2019. Comparing this with Table 2 showing the evolution of liquidity, we can see that performance started to decline at the same time when liquidity position started to increase for the banks. So our hypotheses that an increase in liquidity risk decrease performance may not hold true.

4. Bank-wise Average Performance

In table 7, we analyze the bank-wise average performance of banks during our study period.

TABLE 7: BANK-WISE AVERAGE PERFORMANCE

FWB	NBP	SND	BOK	BOP	ABL	ASK	ABK	BAH	BAF	BISL	DIB	FBL
-0.02	0.16	0.06	0.08	0.03	0.24	0.09	-0.04	0.24	0.14	0.03	0.04	0.11
HBL	HMB	JS	KASB	MCB	MZN	SMB	SILK	SNRI	SCBL	SMT	UBL	
0.18	0.16	0.06	-0.21	0.17	0.19	0.00	-1.56	0.08	0.12	-0.44	0.21	

Allied Bank Limited (ABL) and Bank Al-Habib (BAH) have the highest average performance during the years, followed by United Bank Limited (UBL). Silk Bank (SILK) has the least performance during the years followed by Summit Bank (SMT) and KASB Bank (KASB). Looking at this data we can see that the banks with higher total assets have better performance and smaller banks are not able to perform very well. Comparing it with our liquidity position data, we can see that Bank Al-Habib also is one of the top three banks with the most liquid assets as compared to total assets. Allied bank also has a liquidity position quite above average.

Considering these results, it is evident that liquidity has a positive effect of performance of commercial banks in Pakistan. Increase in liquidity incurs opportunity costs to the bank as liquid assets have low interest rates. On the other hand, less liquidity can result in bank's inability to pay their depositors when they wish to withdraw funds. Therefore, a minimum ratio needs to be set for liquid assets to bring an optimum level of risk and return. In line with this observation, the central bank in Pakistan, called the State Bank of Pakistan (SBP), has issued a Statutory Reserve Ratio SRR) and Statutory Liquidity Ratio (SLR) to be maintained by all banks to avoid default and as a regulatory concern to modulate liquid assets. Current study can help regulators to be better informed of the effect of liquidity position on performance of banks. This will be useful to set an appropriate Cash Liquidity Reserve ratio for the banks to be able to reap maximum benefits.

CONCLUSION AND RECOMMENDATIONS

The results of this study show a positive effect of maintaining liquidity on the performance of the banks in Pakistan. An increase in liquidity ratio has a positive effect of performance of banks in Pakistan. The results are significant for Return on assets but not for Return on Equity. However, both show a positive relation of liquidity position with banks' performance. The results are similar to a number of studies in different regions of the world. Studies conducted in banking sectors of Iran, Europe, Tunisia, South Africa, Malaysia and other regions show promising performance with an increase in liquidity position (Cuong Ly, 2015; Tabari, Ahmadi and Emami, 2013; Hakimi, Zaghdoudi, 2017; Mamatazakis &

Bermapi, 2014; Marozva, 2015). Studies by Ongore and Kusa (2013), Olagunju et al. (2011) and Nimer et al. (2013) and have also shown a similar trend. Their study also shows a positive relationship between liquidity position and banks' performance. However, the works of Cuong Ly (2015), Tabari et al. (2013), and Marozva (2015) show a negative relationship between the two variables. An increase in liquidity incurs opportunity costs to the bank as liquid assets have low-interest rates. On the other hand, less liquidity can result in bank's inability to pay their depositors when they wish to withdraw funds. The relationship of liquidity with bank's performance has garnered varied results through different regions and time periods. Therefore, an extensive study to determine their impact on the Pakistani market is required to formulate better policies for this region. This study has important implications for formulating a better regulatory framework. Already banks in Pakistan are required by Pakistan's Central bank, i.e., State Bank of Pakistan (SBP), to maintain a minimum Statutory Reserve Ratio (SRR) and Statutory Liquidity Ratio (SLR), i.e., a minimum liquidity ratio to avoid liquidity risk. This will enable SBP to be able to ascertain the implications faced by the Pakistani banks if too high or too low liquidity position is maintained by them.

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APPENDIX I:

LIST OF BANKS WITH ABBREVIATIONS USED

FWB	First Women Bank Ltd
NBP	National Bank of Pakistan
SND	Sindha Bank Ltd
BOK	Bank of Khyber
BOP	Bank of Punjab
ABL	Allied Bank Ltd
ASK	Askari Bank Ltd
ABK	Albaraka Bank Ltd
BAH	Bank Al Habib Ltd
BAF	Bank Alfalah Ltd
BISL	Bank Islami Ltd
DIB	Dubai Islami Bank Ltd
FBL	Faysal Bank Ltd
HBL	Habib Bank Ltd
HMB	Habib Metropolitan Bank Ltd
JS	JS Bank Ltd
KASB	Kasb Bank Ltd
MCB	MCB Bank Ltd
MZN	Meezan Bank Ltd
SMBA	Samba Bank Ltd
SILK	Silk Bank Ltd
SNRI	Soneri Bank Ltd
SCBL	Standard Chartered Bank Ltd
SMIT	Summit Bank Ltd
UBL	United Bank Ltd