LIQUIDITY RISK AND ITS IMPACT ON FINANCIAL PERFORMANCE OF FINANCIAL INSTITUTIONS IN PAKISTAN

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Abstract. *The 2007-08 financial crisis highlights the significance of sound liquidity management. Liquidity risk is one of the key issues for financial institutions. An organization with a strong asset base, adequate capital and earning may fail if not sustained with good liquidity positions. This study attempts to empirically examine the impact of liquidity risk on the performance of selected banks operating in Pakistan. The panel data over a period of 2006-2015 was collected from the yearly published financial statements of banks working in Pakistan. The data was examined through regression model. Bank size, nonperforming loan ratio and capital adequacy ratio were used as surrogate variable for liquidity risk. The profitability of the selected banks was measured by taking the ratio of return on assets. The results of the regression model show a major impact of liquidity risk on the performance of Banking Institutions. The influence of the capital adequacy ratio and bank size was found significant and positive, while the influence of the nonperforming loan ratio proved insignificant. This study helps to understand the important parameters of liquidity risk and their influence on bank profitability. This study is valuable for risk managers to alleviate liquidity risk by having satisfactory liquid assets. This minimizes the liquidity gap and dependency of the financial institutions on the repo market.*

Keywords: Liquidity risk, profitability, banking institutions, Pakistan.

Introduction

The 2007-08 worst global financial downturn after the Great Depression of the 1930s drag down the world financial system. The subprime mortgage crisis has affected financial institutions, particularly banks become apprehensive about advancing to other institutions due to acute shortage of liquidity. Most of the financial institutions were exposed to lack the forecasting models for the effective management of liquidity risks. These insufficiencies lead to liquidity crisis and the deterioration of the balance sheet as well as the problems of finding new sources of funds (Cucinelli, 2013).

As stated by Jenkinson (2008), the worldwide financial devastation of 2007-08 emphasized that liquidity risk has a momentous impact on the viability of the financial institutions. Banking institutions perform an extensive activity that exposed them to financial risk. Liquidity issues affect bank's reserve and capital as well as breakdowns the whole banking system. Banking institutions get loans from the money lenders even at a higher interest rate when facing liquidity problems. Bordeleau and Graham (2010) stated that the profitability of banks can be changed with liquid assets, simply holding more liquid asset may reduce bank earnings. Inadequate liquidity is just like a person's suffering from a fever; it is an indicator of serious problem and can lead to collapse and insolvency. Efficient and firm economic system is highly dependent on strong financial system. The less advantaged operational and financial activities of financial institutions affect economic growth and disrupt the entire structure of a country's economy. The good performance of financial institutions means prosperity and economic growth (Khan & Ssnhadji, 2001).

There are various issues concerning Pakistani financial institutions (i.e. Banks), such as higher percent of non-performing loans, lower level of profitability, capital adequacy ratio, poor marketability, wider gap between assets and liabilities and faulty risk management practices. With deficient ability of handling risk, financial institutions in Pakistan are exposed to un-diversifiable risk under the market economy environment.

Liquidity risk arises when the business entity becomes unable to satisfy its obligations (Choudhry, 2013; Nikolaou, 2009). It also rises when an organization borrows at a higher rate of interest or facing penalty overheads under pledged tenures, or trade assets at a lower price in the market. The notion of liquidity in the financial and economic literature explains liquidity as the business ability to exchange its prevailing wealth without any price depreciation. Liquidity is a term which describe in term of flow put simply, it is a flow concept (Nikolaou, 2009).

According to Chorafas (2002), liquidity is the most crucial component of the risk-management process of any organization. It is obligatory for regulative bodies as well as for the management of financial institutions to concentrate on this distinct element. The regulative bodies pledged to shield the financial steadiness of the financial sector for which liquidity is the most important factor. The systematic liquidity crisis causes the failure of the mainstream financial institutions. As a result, the early indicators for liquidity risk management become an area of consideration for bank management and regulatory bodies (Matz & Neu, 2006).

Liquidity risk has a momentous effect on the repository capital structure and capability. Consequently, it becomes important for bank management to

arrange accessible resources to fulfill the demands of the debtors and creditors at acceptable costs. Controlling and monitoring of the liquidity risk are mandatory for financial institutions. It is a key element of the risk-management process. Financial institutions should focus on the effective management of market, credit and liquidity risk. This task can be attained when the organizations develop a good business sense. Liquidity risk affects the overall performance of the organization as well as depositor's confidence (Jenkinson, 2008).

The strength and stability of the financial institutions particularly banking industry are a cardinal requirement to ensure the economic progress and steadiness. As a result, the evaluation and assessment of bank's financial position become the ultimate goal of management and regulators (Halling & Hayden, 2006).

Objectives of the Study

1. To investigates the impact of liquidity risk on the profitability of Bank working in Pakistan.
2. To measure the elements of liquidity risk in terms of the firm's size, non-performing loan's ratio, and capital adequacy ratio.

Literature Review

Liquidity is the potential of the financial service companies to fulfill the clients cash requirements and make available advances in the forms of overdrafts and financial loans. Liquidity is also banks cash and cash equivalent such as treasury bills and commercial papers etc. According to Acharya and Mora (2015) banks have an important role as liquidity providers in a time of financial crisis. The provision of liquidity from banking institutions is possible with strong assistance from the government, and government sponsored agencies. At the beginning of the crisis of 2007-2008, the cumulative inflow of deposits becomes weakened and loan to deposit deficit was widened, which exposed banking institutions to higher undrawn commitments.

The profitability of financial sector has received substantial attentions in recent years. The researchers used a variety of indicators to calculate profit including return on assets, return on equity and net interest margin. At the same time, researchers have a different view in comparison on the superiority of an indicator over others. According to researcher (e.g., Goudreau & Whitehead, 1989; Uchendu, 1995) there are three important indicators of profitability which are return on equity (ROE), return on assets (ROA) and net interest margin. Hancock (1989) and Ogunleye (1995) also identified ROA and ROE as a measure of profitability widely used in the literature.

Ly (2015) examined the relationship between European banks performance and liquidity risk. The main finding of the research study confirms a negative association between banks performance and liquidity risk.

Marozva (2015) investigated the relationship of bank performance with the liquidity of banking institutions in South Africa from 1998 to 2014. The researcher has applied two econometrics models -OLS and ARDL- and found an unfavorable relationship between funding liquidity and net interest margin. He recommends further research for the valuation of liquidity related to asset liability misalliances. According to Amin, Sanusi, Kusairi, and Abdallah (2014) the inverse relationship between financial performance and financial risk cannot be avoided. Gezu (2014) found the insignificant relationship between banks profitability and non-performing loans and reported the downhill sloping of the non-performing loans.

Berríos (2013) mentioned that risky lending reduces the institution liquidity and profitability. Asset quality and earning play an important role in a bank's financial positions. Poor asset quality adversely affects the bank's liquidity positions. Low level of bank assets and higher levels of non-performing loans have a negative impact on the bank's profitability. Higher profitability helps to satisfy the bank's liquidity requirements. Lower profitability translates into lower availability of cash (Dugar, 2015).

The influence of liquidity risk on commercial bank performance examined by Tabari, Ahmadi, and Emami (2013) depicted that bank assets, bank size, inflation rate and GDP improve the competence of the banking institutions. Furthermore, liquidity risk and credit risk can decline the bank's performance. According to Arif and Anees (2012) non-performing loans (NPL) and liquidity gap have an unfavorable relationship with bank's profitability. Banking institutions with a large level of deposit's transaction never face a higher risk.

Non-performing loans (NPL) referred to that types of loans, which are not paid according to the terms and conditions. Caprio and Klingebiel (1996) and Van Greuning and Brajovic-Bratanovic (2009) stated that non-performing loans did not proliferate earning comparatively for longer periods. Payment of principal or interest on non-performing loans have been not paid after the repayment due date.Interest on loans is considered to be the primary sources of bank income. However, some customers whose banks provide loans, break down their contractual obligations of reimbursing the loans. According to Stuti and Bansal (2013) the non-performing loan ratio is the most important indicator of the health and success of the finacial industry. It reflects the performance of the banking institutions. Low level of non-performing loans indicates expansion of the assets quality and improvement in the credit

portfolios of the banks. Conversely, high level of non-performing loansare consider threate to the stability and its lock the nature of recovery. Delays in loan settlement make acquiring further credit more challenging which leads to debt default and bankfruptcy. It could annihilate the bank profitabiltiy through loss of principle amount and interest income.Nonperforming loans affect the bank's operating performance and as a result affect liquidity, solvency and profitability (Michael, 2006).

According to Jenkinson (2008) banks need to comprehend liquidity risk, support market disclosure with robust standard and formulate excellent contingency funding plans. The management of liquidity risk is inevitable for bank's transformation function. The rapid improvement of structured products and increased interconnectedness of the system exposed banks to liquidity risk.

As stated by Allen, Peristiani, and Saunders (1989) the organization attitude with regards to liquidity is influenced by its characteristics, assets base, product types, and status. The organization assets base changes the strategy of the financial institutions towards extensive funding along with it accesses opportunities. Large-size banks have better opportunities to access to the inter-bank market through a large network of legitimate counterparts. Banking institutions need to maintain an adequate liquidity level to meet depositor's demands and offer loans and commitment (Kashyap, Rajan, & Stein, 2002).

On the word of Bessis (2002) liquidity risk has many scales and magnitudes. It is the inability of the financial institutions to nurture funds at reasonable cost. Liquidity risk arises when the value of the current asset is not satisfactory to fulfill the organization's current obligation. From this point of view, liquidity is the extent to support situations that are disadvantageous to institutions.

Muranaga and Ohsawa (1997) break down the liquidity risk into execution cost and opportunity cost. They determined that the liquidity risk is the incapability of the institution. Kashyap, et al. (2002) studied various aspects of liquidity issues, for instance, long-term lending and massive commitment. They reported that withdrawal and commitment are inversely correlated.

Conceptual Framework

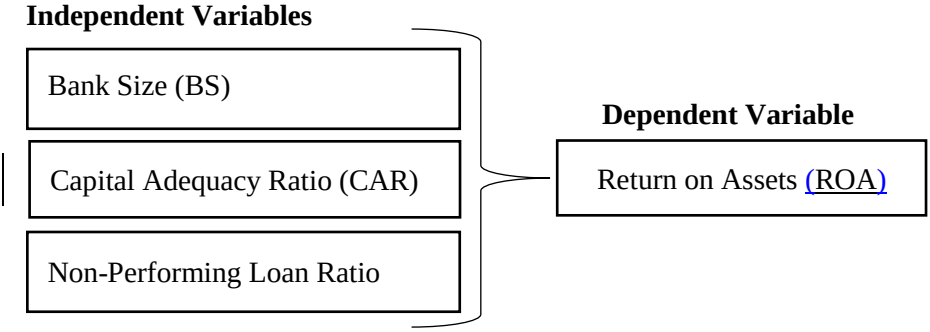
Liquidity risk got the substantial attention of risk specialists and regulatory bodies in recent years. It has a devastating effect on financial institutions profitability (Diamond & Rajan, 1999). It also adversely affects the overall earnings, capital adequacy, and assets base of the financial institutions. Regulatory bodies and management of the financial institutions now concentrate on this risk. As stated by Bryant (1980) and Diamond and Dybvig (1983) liquidity creation is a central function of banking institutions in order to fulfill the customers demand. It also play important role of risk transformers (Diamond, 1984).

According to Shen, Chen, Kao, and Yeh (2009)banks assets base are the crucial determinants of liquidity risk. Liquidity risk is positively associated with bank assets base (Size) which contributes to liquidity level. It also affects the banks' ability to mobilize funds from multiple sources. Banks with strong assets base become able to provide more loan and get the distinctive competency to mobilize customers deposits without any exertion. Bunda and Desquilbet (2008) and Abdelrahim (2013) found a positive correlation between bank size and liquidity risk. In emerging economies, bank size considers very important determinants of liquidity risk. Banks with strong assets base adopted superior, sophisticated and scientific risk management practices (Santomero, 1995). The first Null hypothesis of the study is that increase in bank size (asset base) leads to minimize profitability of the banks.

Capital adequacy is the statutory minimum capital needed to satisfy economic capital constraint that determines the essence and stability of the bank. Financial institutions with adequate capital can acquire more liquidity from central bank against the adequate pledge. Furthermore, the aim of the Basel Accord is to create an association between risk and bank regulatory capital by focusing on diversification, which result is to minimize mismatch between liquidity and solvency (Lannoo & Casey, 2005). The second Null hypothesis of the study is that Increase in capital adequacy leads to minimize profitability of the banks.

Non-performing loans (NPLs) are considered "financial pollution" because of their negative impact on the business profitability and overall economic growth of the country (Gonzales-Hermosillo, 1999). A loan is an asset for financial institutions as the repayment of the principle amount and interest payment create a stream of cash inflows. Interest payment is the main source of profitability for banks. Banking institutions usually consider assets as non-performing if they are not received within specified time. Higher level/degree of non-performing loans are considered a symbol of crises.

In this research, NPL ratio was used as a proxy variable for risk management. The third hypothesis of the study is that increase in non-performing loans leads to lower profitability. NPL ratio has been used by many researchers (Afriyie & Akotey, 2013; Banker, Chang, & Lee, 2010; Berger & DeYoung, 1997; Das & Ghosh, 2006; Hsiao, Chang, Cianci, & Huang, 2010; Jha, Hui, & Sun, 2013; Karim, Chan, & Hassan, 2010).



Sources: Conceptual Framework, 2017

Research Hypotheses

$H_{01.}$ The increase in bank size (asset base) leads to reduction in profitability of the Financial Institutions.

$H_{02.}$ The increase in non-performing loans leads to reduction in profitability of the Financial Institutions.

$H_{03.}$ The increase in capital adequacy leads to reduction in profitability of the Financial Institutions.

Research Methodology

Source of Data

Secondary data was collected from the annual financial reports of banks operating in Pakistan. The panel data includes 330 observations from 2006 to 2015.

Sample size

A total number of 33Banks are selected in this research study. Banks and Development Financial Institutions are selected through convenience sampling technique.

Statistical Model

To test the null hypothesis and analyzed the impact of liquidity risk on profitability, we have applied panel data regression model following the studies of (Espinoza & Prasad, 2010; Imbierowicz & Rauch, 2014; Louzis, Vouldis, & Metaxas, 2012). For financial institutions performance, the ratio return on assets was taken as a proxy variable. The nonperforming loan ratio (NPLR), Bank Size (BS) and the Capital Adequacy Ratio (CAR) were used as proxy variables for liquidity risk.

$Y_{i,t} = \partial + \beta x_{i,t} + \in_{i,t}$----------(1)

Where:

Y is the dependent variable, x is the independent variable, ∂ and β are coefficients, i and t are indices for banks and time. The error $\in_{it}$ is very important in this analysis. Assumption bout the error term determines whether to used fixed effect or random effect.

$ROA_{i,t} = \partial + \beta_1 BS_{i,t} + + \beta_2 CAR_{i,t} + + \beta_3 NPLR_{i,t} + \in_{i,t}$ ----------*(2)*

Where:

ROA= Return on Asset

BS= Bank Size

NPLR= Non-Performing Loan Ratio

CAR= Capital Adequacy Ratio

Table 1 *Description and Measurement of Variables*

Variables	Definition	Measurement
ROA	Return on Asset	Net Profit / Total Assets
BS	Bank Size	Natural Logarithm of Total Assets
NPLR	Non-Performing Loan ratio	Non-performing Loans / Total Loans
CAR	Capital Adequacy Ratio	Tier 1 Capital + Tier 2 Capital / Risk-weighted Assets

Data Analysis and Findings

Table 2 *Descriptive Statistics*

Variables	Observation	Mean	Std. Dev.	Minimum	Maximum
ROA	330	5.37	20.84591	-122.99	234.71
BS	330	18.27	1.582684	15.15	21.52
NPLR	330	17.5	20.14978	0	99.84
CAR	330	15.77	5.194197	10.22	49.7

Table 2 shows the descriptive statistics of the variables used for the analysis. The total number of observations shown in the above table is 330. The average mean value of the return on assets (ROA) is 5.370242, which have an optimal value of 234.71 and minimal value of -122.99. Bank size (BS) shows a mean score of 18.27374, which has a standard deviation of 1.582684. The NPLR has an average score of 17.4893 with a standard deviation of 20.14978.The capital adequacy ratio (CAR) has an average value of 15.77393 and a standard deviation of 5.194197.

Table 3 *Correlation Matrix*

	ROA	BS	NPLR	CAR
ROA	1.00			
BS	0.29	1.00		
NPLR	-0.21	-0.44	1.00	
CAR	0.10	-0.05	-0.05	1.00

Table 3 shows the correlation matrix of endogenous variables (ROA) and exogenous variables (BS, NPLR, CAR).As shown in the table above, there is a positive correlation coefficient between bank size, capital adequacy ratio and return on asset. On the other hand, there is a negative correlation between the nonperforming loan ratio and return on assets. The positive correlation between return on assets and bank size signifies that large bank size contributes to higher profitability. It also enables organizations to reach economies of scales. The positive correlation between the bank size and the bank's performance is similar to that of Flamini, Schumacher, and McDonald (2009) and Regehr and Sengupta (2016). These authors mentioned that the bank's management has a valid reason to think about the favorable relationship between profitability and size. Improving bank size enables the organizations to disperse the fixed cost over a larger asset base, in doing so they can reduce their average cost. Large

bank size also chopped down risk through diversification of operations, product lines and sectors.

The correlation between ROA and NPLR is shown in table 3, which is -0.2130. The correlation analysis shows the strong negative association between NPLR and ROA.Negative correlation means that the high level NPLs detrimentaly effectuate the profitability of the financial institutions. The result of correlation analysis between NPLs and the profitability of the bank (ROA) is similar to the previous study of Mohammed (2012) and Shingjergji (2013).

The correlation value between ROA and CAR is 0.0996, which indicate a positive correlation, which indicates that CAR has an optimistic effect on the profitabilty of financial institutions. These results are similar to the previous result of (Olalekan & Adeyinka, 2013).

Table 4 *Variance Inflation Factor*

Variable	**VIF**	**1/VIF**
BS	1.25	0.803
NPLR	1.24	0.804
CAR	1.01	0.993
Mean VIF	1.17	

Table 4 presents variance inflation factors (VIF). The VIF is one of the most important method used for the detection of multicollinearity (O'brien, 2007). It gives a reasonable sign of the effect of multicollinearity. The existence of the Multicollinearity can maximize the variance between the variables used in the model. The high co-variances between one or more input variables are problematic in the regression model because of variable add very slight or even no new independent information to the model (Belsley, Kuh, & Welsch, 2005). The value of the VIF should not exceed 10.The VIF report shown in Table 4 above clarifies that there is no multicollinearity problem between the input variables used for this analysis.

Table 5 *Regression Result (Random-Effect GLS Regression)*

Number of observations	= 330	Observation per group: minimum =10				
Number of groups	= 33	Average			=10.0	
R-square: within		= 0.447	Maximum		=10	
chi2 (3)	=34.03	probability> chi2			=0.00	
ROA	**Coef.**	**Std. Err.**	**Z**	**P>|z|**	**95% Conf.**	**Interval**
BS	3.62	.852	4.26	0.00	1.95	5.29
NPLR	-.09	.065	-1.26	0.16	-.22	.036
CAR	.45	.221	2.02	0.04	.01	.878
Cons	-66.3	16.6	-3.98	0.00	-98.9	-33.66

Hausman Fixed. chi2(3)= 5.72 Prob>chi2 = 0.1260

Table 4 revealed the results of regression analysis. According to the data presented in the table, the overall model has been fitted. The overall value R^2also called coefficient of determination is *0.447* with a significant p-value of *0.00*. The R^2 value reveals*44.70* % deviation in return on assets (ROA) is because of liquidity risk variables used for this analysis. Based on Hausman test the p-value is found more than 0.005 (Prob>chi2=0.1260). Therefore, the random effect model is more suitable for the analysis.

Bank Size (BS): The result of the random effect model shows the coefficient 3.623879 along with significant P-value of 0.000. This means that the size of the Bank (BS) has a positive and significant relationship with the profitability of the financial institution (ROA). So, from the result, the $H_{01}$is rejected. As a result of the analysis, the increase in the asset base of banks during the research period (2006-2015) was found to have a positive impact on overall profitability (ROA) of banks working in Pakistan. The finding the analysis is similar to the study of (Goddard, Molyneux, & Wilson, 2004; Steinherr & Huveneers, 1994) who found the mix effect of bank size on profitability (Arif, Khan, & Iqbal, 2013; Ferrouhi, 2014; Tabari, et al., 2013; Velnampy, 2010).

Non-performing Loan Ratio (NPLR): The association between NPLR and banks performance shown in the above-mentioned table is unfavorable and insignificant (Coef. -0.091 p-value 0.163). The result leads to the rejection of the H_{02}. The outcome implies that a change in the amount of non-performing loan (NPLR) definitely trigger the banking institution's profitability (ROA).

The results of the analysis are consistent with the previous studies (Al-Khouri, 2011; Gizaw, Kebede, & Selvaraj, 2015; Kithinji, 2010; Kosmidou, Pasiouras, Doumpos, & Zopounidis, 2006; Sufian & Chong, 2008; Tafri, Hamid, Meera, & Omar, 2009; Tracey & Leon, 2011). These studies have found negative association between profitability (ROA) and non-performing loan ratio (NPLR).

Capital adequacy Ratio (CAR): Table 04 shows the results of the random effect model (coefficient. = 4451058, p = 0.044). The coefficient and significant p-values indicate that the capital adequacy ratio (CAR) has a positive and significant impact on banks profitability (ROA). The result leads to the rejection of H_{03}. The results of the study are similar to previous studies (Bateni, Vakilifard, & Asghari, 2014; Olalekan & Adeyinka, 2013). These studies have reported a good and significant relationship between profitability (ROA) and capital adequacy ratios. The results of the analysis are also consistent with previous studies (Demirgüç-Kunt & Huizinga, 1999; Gizaw, et al., 2015; Gul, Irshad, & Zaman, 2011; Kosmidou, et al., 2006; Naceur, 2003; Valverde & Fernández, 2007).

Results

It is concluded based on the analysis that bank assets size (BS) and capital adequacy ratio (CAR) have a significant and positive impact on the performance of the selected banks working in Pakistan. The effect of the non-performing loan ratio was observed detrimental and insignificant, which implies that higher rate of non-performing loans contributes to reduce theprofitability of the banks. The non-performing loan can be employed as a possible measuring instrument of financial performance. A lower ratio of non-performing loan signifies enhancement in the asset quality. A much higher rate of non-performing loans is a situation of apprehension for financial institutions. The overall results of the study is consistent with previous studies (Al-Khouri, 2011Al-Khouri, 2011; Batra, 2003; Berger & DeYoung, 1997; Demirgüç-Kunt & Huizinga, 1999; Gizaw, et al., 2015; Goddard, et al., 2004; Gul, et al., 2011; Kithinji, 2010; Kosmidou, et al., 2006; Michael, 2006; Muasya, 2009; Naceur, 2003; Steinherr & Huveneers, 1994; Sufian & Chong, 2008; Tafri, et al., 2009; Tracey & Leon, 2011; Valverde & Fernández, 2007).

Conclusion

Liquidity crisis may adversely upset the financial institution's profitability. Under extreme conditions, it may lead to failure/ collapse of an organization. Financial institutions with a shortage of liquidity may encounter problems in satisfying the depositor's requirements. Therefore, it is important for financial institutions to continuously monitor its liquidity positions. This may help them get competitive edge and enhancement of their investment portfolio. It should be the highest priority of the financial institution's management to consider this important issue. The liquidity issues must be constantly tackled, and prompt curative measure should be taken to escape the upshots of illiquidity.

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