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Liquidity Risk Management of Islamic Banks in Bangladesh

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ABSTRACT

The banking sector is the lifeblood of the economy. Today, most banks either conventional or Islamic banks face many types of risks. One of the risks is liquidity risk. One of the prime functions of the bank is to collect short-term deposits from depositors in order to finance long-term loans and advances. Failing to fulfil the condition creates a situation for banks where the banks face liquidity risk. Liquidity risk is the risk where an organization is unable to meet their obligations to depositors. The liquidity risk arises from management weakness of proper forecasting of needs of funds in future. As Islamic banking is gaining popularity, Islamic banks are also facing liquidity risk. This study was conducted to investigate the relationship between sizes of the bank, nonperforming loan (NPL), return on asset (ROA), return on equity (ROE), capital adequacy ratio (CAR), and investment to deposit ratio (ITD) with liquidity risk of 6 Islamic Banks from 2012 to 2016. Secondary data are being used in this study. This study found a relationship between the size of the bank, the NPL, ROA, ROE, CAR, and ITD with liquidity risk by rejecting the null hypothesis. The study also found that size and NPL have a negative relation to liquidity risk and ROA, ROE, CAR, and Investment to deposit ratio has a positive relationship with liquidity risk.

Keywords: Liquidity, Liquidity Risk, Non-Performing Loan, ROA, ROE.

1. INTRODUCTION

A bank is considered to have liquidity solvency if the bank can collect funds (by expanding liabilities, securitizing, or offering resources) at a minimum cost. The price of liquidity is a function of market conditions and the market's perception of the inherent riskiness of the borrowing institution. The cost of liquidity is an element of market conditions and the market's impression of the intrinsic risk of the borrowing institution (Mobin, Ahmad, 2014). Liquidity risk results from the mismatch between maturities on the two sides of the balance sheet, creating either a surplus of cash that must be invested or a shortage of cash that must be funded (Akhtar, Ali, & Sadaqat, 2011).

Since the mid-70s, over 70 countries about 57 developing and emerging countries and 13 other developed countries of the world get access to Islamic finance and banking (Otiti, 2014). Islamic banking started its operations in Bangladesh in 1983. Now, alongside full-fledged Islamic banks, a good number of conventional banks have been offering Islamic banking services using their branch networks. From the beginning, Islamic banks are performing dominantly over conventional banks by providing liquidity, ensure profitability, and attaining the trust of clients (Alamgir, 2014).

Now, the economy of Bangladesh is confronting extraordinary obstacles in liquidity accessibility which is considered by the experts as the worst liquidity crisis the country ever faced. Banks in Bangladesh are facing huge challenges for proceeding with their everyday operation even though they do not have enough cash in hand for serving customers. Banks are urgently looking

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for collecting deposits and interest rate of deposit is continuously. Therefore, operational cost for banks expanded with the decrease of spread – the sum which is the basis of banks profit (Tahera, 2014).

Islamic banks face two types of liquidity risk: lack of liquidity in the market and lack of access to funding. In the first case, illiquid assets make it difficult for the financial institution to meet its liabilities and financial obligations. In the second, the institution is unable to borrow or raise funds at a reasonable cost, when needed (Greuning & Iqbal, 2008). Now, most of the private commercial banks in Bangladesh have crossed the loan-deposit ratio (LDR) limit and are chasing after deposits to bring down the ratio within 85% because they cannot recover the loans overnight. 85% of loan to deposit ratio indicates that the bank has the ability to give Tk 85 against Tk 100 deposit. Banks offered 5-7 percent interest on fixed deposits for the last two years. But this rate has gone up to 8-9 percent in recent days due to the liquidity crisis (Rahman, 2018). So, it is a crucial need to investigate the liquidity crisis faced by the Islamic Banks in Bangladesh in order to reduce the volatility of the banking sector.

2. LITERATURE REVIEW

Liquidity risk arises as a result of liquid assets fail to meet liabilities. Higher liquidity is required if a higher amount of loan is taken to construct an asset portfolio. A bank will be required to keep sufficient liquid asset if customer's withdrawal rate is high (Greuning & Iqbal, 2008).

A study of the liquidity risk management of conventional and Islamic banks of Pakistan from 2007 to 2010 showed that size, CAR, ROA, and ROE have a positive relationship with liquidity risk. On the other hand, NPL is negatively related with liquidity (Iqbal, 2012). A similar study of liquidity risk management of Islamic banks in Pakistan for the period 2006 to 2010 found a positive relationship between the size of the bank, capital adequacy ratio, and management of the asset with liquidity risk and a negative relation between liquidity risk and NPL (Ahmed, Akhtar, & Usamn, 2011).

A research was done to find out the determinants of liquidity risk and the impact liquidity risk has on Islamic and conventional banks of Malaysia and Bahrain. The result indicated that liquidity has significant impact in managing risk. The study also found a positive relation between total asset growth, loan to deposit, bank size with liquidity risk and negative relationship between deposit volatility and bank capitalization with liquidity risk (Zolkifli, Hamid and Janor, 2015). A study on liquidity risk management of 6 conventional and 6 Islamic Banks of Pakistan from 2006 until 2009 revealed that ROA and ROE was significant and Islamic banks were efficient in managing liquidity risk (Akhtar, Ali & Sadaqat, 2011). Studies on the liquidity position of conventional and Islamic banks in Bangladesh showed that in the case of both short and long-term, Islamic banks are in a better position compared to conventional banks (Islam and Chowdhury, 2007). A similar study compared the liquidity position of Islamic banks and conventional banks in Indonesia from 2000 to 2007. Current ratio, cash deposit ratio, loan-deposit ratio and current asset ratio were taken to find out the position. Mann-Whitney Model was used to test the hypothesis. The result showed that Islamic banks are in a good position compared to conventional banks (Ika and Abdullah, 2011). A study on the impact of liquidity risk and portfolio management of the financial system of Japan found that bank size have found a positive relationship with liquidity risk (Sawada, 2010).

After reviewing the literature, the following research questions were set for this study: 1) The degree of liquidity risk faced by Islamic banks in Bangladesh over the past five years, and 2) The relationship between liquidity risk and financial performance.

Based on the research questions, the following objectives are set for this study: 1) To assess the liquidity risks faced by Islamic Banks in Bangladesh over the past 5 years, and 2) To identify the relationship and impact of the size of the bank, non-performing loan, return on equity, return on asset, capital adequacy ratio, and investment to deposit ratio with liquidity risk of 6 Islamic banks in Bangladesh.

A number of researchers discussed about bank size and liquidity in their study. In the study of Sawada (2010), Akhtar, Ali and Sadaqat (2011), and Zolkifli, Hamid and Janor (2015), they found that the size of the bank is positively related to liquidity risk management. So the first hypothesis is:

Ha1: There is a positive relationship between the size of the bank and liquidity risk management.

Nonperforming loans are default loans that cannot be paid by customers to banks for a specific period of time (Chowdhury, 2018). If banks cannot collect funds, then there is a shortage of funds for banks. So, banks cannot provide liquidity to the customers. Iqbal (2012) found a negative relationship between nonperforming loan and liquidity risk. The second hypothesis is:

Ha2: There is a negative relationship between nonperforming loan and liquidity risk management.

Return on asset, return on equity, and capital adequacy ratio is positively related to liquidity risk management found in the study between conventional and Islamic banks in Bangladesh. ROA, ROE, and CAR are positively related in the case of conventional banks (Rahman & Banna, 2014).

So the next three hypotheses are:

Ha3: There is a positive relationship between return on assets and liquidity risk management.

Ha4: There is a positive relationship between return on equity and liquidity risk management.

Ha5: There is a positive relationship between capital adequacy ratio and liquidity risk management.

Several studies have been made about the relationship between loan to deposit ratio and liquidity risk. As a result of an increase in loan to deposit ratio, the deposit is not adequate to banks (Golin, 2001). Lower loan to deposit ratio will cause the bank to meet the customers' withdrawal of money and loans (Indriani, 2008). So, from the study it is found that investment to deposit ratio is positively related to liquidity risk (Zolkifli, Hamid and Janor, 2015). Thus, the hypothesis can be stated as:

Ha6: There is a relationship between investment to deposit ratio and liquidity risk management.

From the study of various research articles, it is seen that most of the work regarding this topic has been done to find out the determinant of liquidity risk management, impact of liquidity risk on performance of banking system, and liquidity position of banks. This study tries to find out how liquidity risk is being managed by Islamic banks. In Bangladesh, very few researches have been done on this topic and banks are facing a serious liquidity crisis. So, the study aims to investigate the relationship between liquidity risk and the factors that have an impact on liquidity risk and also propose some techniques and strategies that will help Islamic banks to effectively handled liquidity risk. This research will pave the way for the further in-depth study of liquidity risk management of Islamic banks not only in Bangladesh but also all over the world.

The research topic was chosen while bearing in mind the possible contribution of the topic in the research field.

3. METHODOLOGY

In the study, liquidity risk was used as a dependent variable. The size of the bank, NPL, ROA, ROE, CAR, and investment to deposit ratio were used as independent variables. Islami Bank Bangladesh Ltd, Exim Bank, First Security Islamic Bank, Shahjalal Islami Bank, Social Islamic Bank, and Al Arafah Islami Bank were selected to find out how liquidity is being managed by the top 6 Islamic banks. Secondary data was taken to collect information. The annual reports from 2012 to 2016 of Islamic banks were used as a source of secondary data. IBM SPSS Software-20 was used to perform the descriptive statistics, correlation analysis, and regression analysis.
Econometric Model used for the study:

$$Y1 = a + \beta 1\, X 1 + \beta 2\, X2 + \beta 3\, X 3 + \beta 4\, X4 + \beta 5\, X5 + \beta 6\, X 6 + € \quad (1)$$

Here Y= Liquidity risk
a = Constant
β 1- β 6= Regression co-efficient of independent variables

The variables and the proxies considered for the study are:

Table 1 Variables and the proxies in this study

Variable	Symbol	Proxies
Liquidity risk	Y	Liquid asset / Total asset
Size of the bank	X1	Logarithm of total asset
NPL	X2	Bad debt/Loan and advances
ROA	X3	Net income / Total asset
ROE	X4	Net income/ Total equity
CAR	X5	(Tier 1 capital + Tier 2 capital) / Risk weighted asset
Investment to deposit ratio	X6	Investment/Total deposit
Error term	€	

3.1 Data Analysis

3.1.1 Ratio Analysis

In the table ratio analysis of six Islamic banks is being done. The liquidity risk was high in 2012 but in 2016 it decreased. Bank size increased in 2016 compared to other years. NPL ratio was increasing from 2012 to 2016 which meant that customers were unable to pay loans. ROE,ROA and Investment to deposit ratio were increasing. CAR ratio was decreasing which Islamic banks should give attention to.

Table 2 Five-year Ratio of Liquidity Risk, Bank Size, NPL, ROE, CAR, ROA

Year	Liquidity Risk	Bank Size	NPL Ratio	ROE	CAR	ROA	Investment to deposit ratio
2012	13.56	5.23	3.8	14.28	11.69	1.48	86.40
2013	10.91	5.28	3.84	11.79	12.76	1.07	84.74
2014	10.35	5.52	4.39	10.62	12.58	1.04	84.08
2015	11.16	5.41	4.24	10.68	12.77	0.96	85.47
2016	11.07	5.48	4.57	13.07	11.89	1.08	87.35

Source: Annual Report of six sample Islamic Banks from 2012-2016.

3.1.1.1 Liquidity Risk

The liquidity risk of the Islamic banks was measured by using the cash and cash equivalent to total assets. The high ratio of liquidity risk indicates a better liquidity position (Nimsith, Shibly, 2015; Iqbal, 2012). According to liquidity risk column in Table 2, the liquidity risk of Islamic Banks had the highest cash and cash equivalent asset in 2012,13.56%. The liquidity risk then decreased from 2012-2014. In 2015 and 2016, it increased slightly compared to 2013 and 2014.

3.1.1.2 Bank Size

The size of the bank is measured by taking the logarithm of total assets (Shibly, Nimsith, 2015; Iqbal, 2012). The size of Islamic Banks is 5.48% in 2016, and it showed an increasing trend from 2012 to 2014. This indicates the differential values liquidity risk management practices of Islamic Banks.

3.1.1.3 Non-Performing Loan Ratio

The non-performing loan ratio is measured using the non-performing loans to total advances. The higher ratios show a large number of bad debts and ultimately the loss for the banks (Iqbal, 2012). The NPL ratio shows that the Islamic banks had the lowest ratio of NPL in 2012. The highest figure for the NPL ratio was in 2016. The reason is in Islamic banks there is a prohibition of interest and Islamic Banks follow other modes of trading, including the profit sharing like Musarakha and Mudarabaha.

3.1.1.4 Return on Equity

The return on equity was measured as the ratio of net income to total equity. The high ratios indicate the better return to the investments of the shareholders (Nimsith, Shibly, 2015; Iqbal, 2012). The ROE ratio of Islamic bank was 14.28% in 2012 but in 2013 it was 11.79%. It showed a declining trend till 2014-2015, and in 2016 it slightly increased from 2013. This means that the external source of fund of Islamic Banks requires higher cost and it decreases profitability.

3.1.1.5 Capital Adequacy Ratio

CAR is the ratio that shows how far the risky banks assets (loans, investments, securities) financed by the bank's own capital funds. It is expressed as a percentage of a bank's risk-weighted credit exposures. CAR ensures the safety of the depositors' money as well as financial soundness of banks (Nimsith, Shibly, 2015; Iqbal, 2012).CAR of Islamic bank showed an increase trends from the year 2012 to 2015 from 11.69% to 12.77%. But in 2016, it decreased to 11.89%, which indicates the slowdown of Islamic banks capital. It means that the capital cannot be used to cover their maturity dates and bank will be in trouble or risky situation.

3.1.1.6. Return on Assets

The return on assets is calculated as net profit of the banks to total assets. The return on assets ratio indicates how much the banks are generating profit through efficient employment of its return (Nimsith, Shibly, 2015; Iqbal, 2012). The ROA of Islamic banks was 1.48% in 2012 which showed a decreasing trend till 2015. In 2016, the ratio was 1.08%, which means banks have good revenue that can be used to cover their short-term obligation.

3.1.1.7 Investment-to-Deposit Ratio

The Investment to-deposit ratio (ITD) is found by dividing the bank's total investment by its total deposits (Zolkifli, Hamid and Janor, 2015). This number is expressed as a percentage. A high ratio indicates a lack of liquidity for the banks to meet the fund's necessary. The low row indicates lack of earning of banks than expected. The trend of this ratio was increased from 2015 to 2016. But, it was in decreasing trend from 2012 to 2014. In 2016, the ratio was 87.36%, which means that Islamic Banks don't have enough liquidity to cover unforeseen fund requirements.

3.2 Descriptive Statistics

In the descriptive statistics section, range, minimum, maximum, mean, standard deviation, variance are shown in Table 3. The liquidity risk is the dependent variable and the size of the bank, NPL, ROA, ROE, CAR, investment to deposit ratio are the independent variables. The range shows the difference between the largest and smallest observations. Minimum and maximum values are smallest and lowest values. Mean shows the average value of all the observations divided by the number of observations. SD measures the risk involved. It also indicates how much spread is available in the data. A low standard deviation indicates there is less risk involved. In the case of all the factors, it can be seen that the risk is very low. It is a good indicator that the data are very closely related to mean and there is less risk involved. The less risk involved found in the Table 3 is a good indicator.

Table 3 Calculation of range, minimum, maximum, mean and standard deviation

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Liquidity risk	*5*	*3.21*	*10.35*	*13.56*	*11.4100*	*1.24240*
Size	*5*	*.40*	*5.29*	*5.69*	*5.4689*	*.15897*
NPL	5	.77	3.80	4.57	4.1680	.33878
ROA	5	.52	.96	1.48	1.1260	.20342
ROE	5	3.66	10.62	14.28	12.0880	1.58078
CAR	5	1.08	11.69	12.77	12.3380	.51085
Investment to deposit ratio	5	3.28	84.08	87.36	85.6160	1.30381
Valid N	5					

3.3 Correlation Analysis

Correlation shows the relationship between the dependent variable and independent variables. It is seen from the Table 3 that dependent variable liquidity risk has a negative relationship with bank size, nonperforming loan and capital adequacy ratio.

Table 4 Pearson correlation test

Items	Liquidity Risk	Size	NPL	ROA	ROE	CAR	Investment to deposit ratio
Liquidity Risk	1						
Size	-.735	1					
NPL	-.604	.845	1				
ROA	.927	-.612	-.586	1			
ROE	.819	-.622	-.346	.861	1		
CAR	-.715	.278	.007	-.782	-.913	1	
Investment to deposit Ratio	.495	-.319	.194	.381	.747	-.785	1

Table 4 indicates that an increase in liquidity risk causes a decrease in the size of the bank, NPL, CAR and vice versa. On the other hand, there exists a positive relationship between dependent variable liquidity risk with ROA, ROE, investment to deposit ratio. It indicates if the dependent variable liquidity risk increases, then ROA, ROE, investment to deposit ratio increases. On the other hand, if dependent variable liquidity risk decreases, then ROA, ROE, investment to deposit ratio decreases. It can further be stated that there is a moderate correlation with liquidity risk and investment to deposit ratio as $.3 < | r | < .5$ and strong correlation between liquidity risk with ROA and ROE as $.5 < | r |$.

3.4 Regression Analysis

R indicates the linear relationship between two variables. The value of R is 0.927 as shown in Table 5 indicates that there is near to perfect positive relationship between dependent variable Liquidity risk and independent variable size, NPL, ROA, ROE, CAR, and investment to deposit ratio. R square tells the degree of variation between dependent variables is described by the independent variables. From the table, the value of R square is 0.860 i.e. 86% of liquidity risk can be explained by size, NPL, ROA, ROE, CAR, and investment to deposit ratio. Adjusted R square shows how closely data are fitted to the regression line. The adjusted R square value about 0.813 gives an indication that 81.3 % of data are closely fitted to the regression line. Durbin Watson Test was done to find if there is autocorrelation involved in the data series. The value ranges from 0 to 4. A value greater than 2 indicates that there is a positive correlation in time series data. It indicates there is consistency in the time series data.

Table 5 Model summary

Model Summary										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.927[a]	.860	.813	.53708	.860	18.404	1	3	.023	2.828
a. Predictors: (Constant), ROA										
b. Dependent Variable: Liquidity risk										

Table 6 shows a relatively higher F value with p-value <0.05 indicate that null hypothesis is rejected and the alternative hypothesis is accepted indicating that there is a relationship between liquidity risk and the size of the bank, NPL, ROA, ROE, CAR and ITD. The regression analysis is able to make a prediction about the liquidity risk position of Islamic banks in Bangladesh. The Anova calculation in Table 6 shows that there is a high F values with smaller P

values. High F values indicate that the model fits the data. This indicates both F value and P value able to predict the response.

Table 6 Anova calculation

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	5.309	1	5.309	18.404	.023[b]
	Residual	.865	3	.288		
	Total	6.174	4			

a. Dependent Variable: Liquidity risk

b. Predictors: (Constant), ROA

Table 7 shows the standardized coefficients beta value of ROA 0.927, indicating that there is a positive relationship between ROA and liquidity risk management. A similar type of relationship with liquidity risk was found by Akhtar, Ali, & Sadaqat (2011) and Rosly & Zaini (2008).

Table 7 Coefficients determination

Coefficients								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**95.0% Confidence Interval for B**	
		B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
1	Constant	5.033	1.506		3.343	.044	.241	9.825
	ROA	5.663	1.320	.927	4.290	.023	1.462	9.865

a. Dependent Variable: Liquidity risk

Table 8 shows the excluded variables. From the beta value, it is seen that size and NPL are negatively related to liquidity risk. The results of negative relationship between size and liquidity risk is found by Aldoseri (2012) and Anam, Hasan, Huda, Uddin and Hossain (2012). NPL and Liquidity risk is also found in the study by Akhtar, Ali, & Sadaqat (2011), Sawada (2010) and Ahmed, Akhtar, and Usamn (2011). On the other hand ROE, CAR and ITD are positively related with liquidity risk. The positive relationshipbetween ROE and CAR with liquidity risk are also found in the study of Akhtar, Ali, & Sadaqat (2011) and Rosly & Zaini (2008).

Table 8 Excluded variables

Excluded Variables						
Model		**Beta In**	**t**	**Sig.**	**Partial Correlation**	**Collinearity Statistics**
						Tolerance
1	Size	-.268[b]	-.973	.433	-.567	.626
	NPL	-.093[b]	-.291	.799	-.201	.657
	ROE	.081[b]	.156	.890	.110	.259
	CAR	.024[b]	.057	.960	.040	.389
	Investment to deposit	.166[b]	.637	.589	.411	.855

a. Dependent Variable: Liquidity risk

b. Predictors in the Model: (Constant), ROA

4. CONCLUSION AND RECOMMENDATIONS

The study analyzed the relationship between size of the bank, nonperforming loan, return on the asset, return on equity, capital adequacy ratio, investment to deposit ratio with liquidity risk by performing ratio analysis, descriptive statistics, correlation, regression analysis. It is prevalent from the data analysis that liquidity risk is attached to Islamic banks. Ratio analysis shows the ratio of the size of the bank, NPL ROA, ROE, investment to deposit ratio have increased in 2016 from 2015. On the other hand, CAR and cash to cash equivalent assets decreased in 2016 from 2015. Islamic banks should follow the following recommendations in order to reduce the liquidity risks:

i. Following principles of IFSB: Islamic Banks have to follow the principles given by IFSB. Principle 1 states that Islamic financial institutions shall have in place a liquidity management framework (including reporting) taking into account separately and on an overall basis their liquidity exposures in respect of each category of current accounts, unrestricted investment accounts, and restricted investment accounts. Principle 2 states that Islamic financial institutions shall undertake liquidity risk commensurate with their ability to have sufficient recourse to Shariah-compliant funds to mitigate such risk.
ii. The introduction of Sukuk (Islamic bonds) is a good alternative that can provide the foundation for the development of secondary markets. The Central Bank of Sudan has followed Shariah compatible securities to provide liquidity in the market.
iii. Establishment of Islamic financial market: To manage liquidity more effectively, it is important to establish the International Islamic Financial Market and liquidity management center.
iv. Assistance from Islamic interbank Money Market: Islamic Interbank Money Market can help to manage liquidity in long term. The practice was introduced by The Malaysian central bank, Bank Negara Malaysia. The activities of the Islamic Interbank Money Market include the purchase and sale of Islamic financial instruments among market participants (including the central bank), interbank investment activities through the mudharabah interbank investment scheme, and a check clearing and settlement system. Financial institutions can buy Shariah-compliant investment issues from the central bank.
v. Diversification of Funds: Islamic banks should pay attention to the diversification of funds so that liquidity sources are created.

Strategies that can be followed by Islamic Banks in order to reduce the liquidity crisis are:

i. Keeping more cash in hand.
ii. Invest in short-term liquid assets.
iii. Take help from Central Bank in case liquidity problem arises.
iv. Careful in sanctioning loans: Loans should be provided in those sectors which have potentiality by taking collateral and examine the 5C (Capital, Collateral, Character, Capacity, Condition) so that there is less chance of loans becoming non-performed.
v. Proper estimation of demand: Banks should estimate the short-term demands of their clients based on past experiences so that irregular demand can be met.

5. LIMITATIONS OF THE STUDY

Secondary Data: Data were collected from the secondary source. There is no chance of collecting data from the primary source.

Sample size: Data from 2012 to 2016 is being used for testing. If a larger amount of sample can be taken there is the possibility of different results.

Lack of research: There is no significant research done on Islamic banks about liquidity risk management in Bangladesh.

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