

Effect of Liquidity Risk on Performance of Islamic banks in Bangladesh:

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Abstract: Banks as a financial institution are facing different kinds of risk now a days. Liquidity risk is one of them. As liquidity crisis is affecting the banking industry of Bangladesh the study aims to analyze the effect of Liquidity risk on the Islamic banks performance for the period 2012 to 2016. In the study ROA and ROE are used as Bank performance measurement tools and Loan to deposit ratio, Liquid risky asset to total asset, Capital to total asset ratio are used as liquidity indicators. Correlation, Regression analysis are done to find the effect of liquidity on bank performance. The correlation found significant relationship between Bank performance and liquidity indicators. On the other hand regression analysis showed that there is negative relation between bank performance and liquidity indicators.

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I. Introduction:

Financial crisis that took place from the period 2007 to 2009 caused a deep concern among the bank regulators. They came up with Basel 3 accord that aim at keeping more reserves in terms of liquid assets for banks to face future financial crisis (BCBS, 2009). Basel Committee made new rules for various type of risks. Among the rules made rules for liquidity risk is one of them (Simone, 2011).

Liquidity risk faced by a bank when the banks cannot meet the customer obligation for money at short notice. (Jenkinson 2008). As banks are considered the life blood of economic growth and stability, failing to meet the customer obligation can create negative impression among customers about the banks. Financial transaction mainly takes place through banks so liquidity risk damages their reputation as well as customer faith towards which eventually leads of bank failure.

Measuring of Bank performance is utmost necessary to see if there is any problem involve or not. The performance of banks varies from banks to banks because of management policy and customer faith towards them.

Banks main functions are receiving deposit, granting loans, meet customer obligation of payment, transfer of goods and services banks face severe liquidity risk.

Liquidity risk can be caused for various reasons .First reason is that inefficiency of banks to cope up with decreasing of liabilities and increase of asset .Another reason is the imbalance between cash inflows and outflows as well as sudden liquidity needs from contingency conditions .Liquidity risk can take place as a result of lending and funding by using off balance sheet items .stated that liquidity problem can damage the good will of banks.opine that lack of liquidity will make bank insolvent. Lack of liquidity can make bankrupt.Liquidity risk have both positive and negative relationship with banks this is stated in literature review.

Both developed and developing country liquidity crisis has now become a serious issue. Facing liquidity has become a challenge now a days .As a developing country Bangladesh has almost 60 government, commercial, Islamic banks. Liquidity crisis in banks has become a serious issue. Bearing in mind the study is done to see if liquidity risk is positively or negatively related to the Islamic banks in Bangladesh

II. Literature review:

Alzorqan(2014) studied the relationship of liquidity risk and bank performance for 2 banks of Jordan from the period 2008 -2010.ROA and ROI were used as indicator of Bank performance. Current ratio and loan to deposit were used as liquidity measures. Correlation and Regression were done to test the relationship. In correlation analysis the relation between Current ratio and ROA as well as Current ratio and ROI are found negative. The relationship between loan to deposit with ROA and ROI are found positive. Overall results indicated that there is a relationship between liquidity risk and bank performance in Jordan banks.

Rahman and Saeed (2015) measured the effects of liquidity risk on performance of 21 commercial banks in Malaysia for the period 2005 to 2013.ROA and ROE are used as indicator to judge bank performance.

Loan to deposit ratio, liquid risky asset to total asset and capital to asset ratio are used as liquidity indicators. The study found liquid risky asset to total asset has negative relation with bank performance. Capital to asset ratio has mixed results on bank performance. The study concluded the effects of liquidity indicators on bank performance are mixed and could not draw a clear result.

Tabari, Ahmadi, Emami (2013) analyzed the effect of liquidity risk on performance of 15 Iranian banks for period of 2003-2010. ROE is taken to judge the performance of banks. Size, Bank's Size Square, liquidity risk, credit risk, bank capital, GDP, inflation are taken as independent variable to find out the effect on bank performance. The study opine that Bank's size, bank's capital, gross domestic product and inflation have positive relation with bank performance but on the other hand credit risk and liquidity risk decreased banks performance. Overall the result indicated that liquidity risk negatively affected the banks performance.

Ferrouhi(2014) studied the financial performance of Moroccan banks with liquidity for the period 2001-2012 taking 4 banks. ROA, ROE, Return on average asset and Net interest margin are used as performance indicator, 6 liquidity ratios and 5 determinants were used. Bank performance have positive relation with bank size, FDI, realization of financial crisis. On the other hand unemployment, capital are negatively related with bank performance. The study further revealed that liquidity ratios have positive relationship with bank performance. Mamatazakis and Bermapi(2014) tried to found out the relationship between liquidity risk and Bank performance in G 7 and Switzerland .The study took sample of 97 banks and found that liquidity risk negatively affects bank performance.

Cuong Ly(2015) investigated the relationship between liquidity risk and bank performance of from 2001 to 2011 of European banks. The result show that liquidity is inversely related with bank performance.

Hakimi, Zaghoudi(2017) studied the effect of liquidity risk on the performance of 10 Tunisian banks from 1990 to 2015. The result of Random effect regression is that liquidity risk decreases the performance of banks. Marozva (2015) studied the relationship between liquidity risk and performance of South African banks for periods 1998 to 2014 .The study used OLS and the ARDL-Bounds tests to see the relationship between net interest margin and liquidity risk. The study revealed that there is negative relationship between liquidity risk and NIM. The study also opine for further investigation.

Musiega, Olweny, Mukanzi and Mutua(2017) analyzed the influence of liquidity risk on 30 commercial banks of Kenya for the period 2006 to 2016 .Correlation analysis , Unit root test ,Regression analysis were done. The study found that there is positive relationship between liquid risky assets to total asset have positive relationship with bank performance.

Bourke(1989) analyzed the performance of banks with liquidity of 12 countries .The study resulted that Europe, North American and Australian banks liquidity are positively related with bank profitability.

Umar, Muhammad, Asad and Mazhar (2015) studied the impact of liquidity risk on 2 Pakistan Conventional Banks for period of 2009 to 2013. The study revealed that current ratio was negatively correlated to banks performance.

Areffin (2012) studied the relationship of liquidity risk and Islamic banks performance of Malaysian banks for period of 2006 to 2008 .The study found that liquidity risk have a reverse relationship with ROA and ROE. Alper and Anbar (2011) used determinants to see the effect of Turkey banks for period 2002-2010 .The results showed that liquidity is positively related to banks performance.

Other researcher regarding the effect of liquidity and Bank performance were done by Kosmidou, Tanna, and Pasiouras (2005), Olagunju, David and Samuel (2012), Molyneux and Thornton (1992).

Objective of the study: The main objective of the study is to see the effect of Liquidity on the performance of Islamic banks for period 2012 to 2016.

III Methodology:

In this study data are collected from the annul website of 6 Islamic banks from 2012 to 2016 .Bank performance is measured by ROA and ROE. ROA and ROE are also used by other researchers .They are: Najid and Rahman (2011), Alkhatib and Harsheh (2012), Almumani (2013), Roman and Sargu (2014), Imbierowicz and Rauch (2014), Rose and Hudgins (2013) & Saeed and Rahman (2015).As an indicator of Liquidity measurement the study used Loan to deposit ratio, Liquid risky asset to total asset and Capital to total asset ratio. IBM SPSS-20 software is used to do the descriptive statistics, correlation analysis and Regression analysis.

Research Model: The econometric model used to test the hypothesis is:

$$Y_1 = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Here Y=Bank performance measured by (ROA and ROE)

a = Constant

$\beta_1 - \beta_3$ = Regression Co efficient of Independent Variables

ϵ = Error term

Variables and their Proxies :

Variable	Symbol	Proxies
ROA	y	Net income / Total asset
ROE	y	Net income/ Total equity
Loan to deposit ratio	X1	Liquid asset / Total asset
Liquid risky asset to total asset	X2	Loan /Total deposit
Capital to total asset ratio	X3	Total equity / Total asset

Hypothesis Development: The following null hypotheses (H0) and alternative hypotheses (Ha) had been constructed for this study. They are:

Ho1: There is no relationship between Loan to deposit ratio and Islamic banks performance

Ha1: There is a relationship between Loan to deposit ratio and Islamic banks performance

H02: There is no relationship between Liquid risky asset to total asset and Islamic banks performance

Ha2: There is a relationship between Liquid risky asset to total asset and Islamic banks performance.

H03: There is no relationship between Capital to total asset and Islamic banks performance.

Ha3: There is a relationship between Capital to total asset and Islamic banks performance.

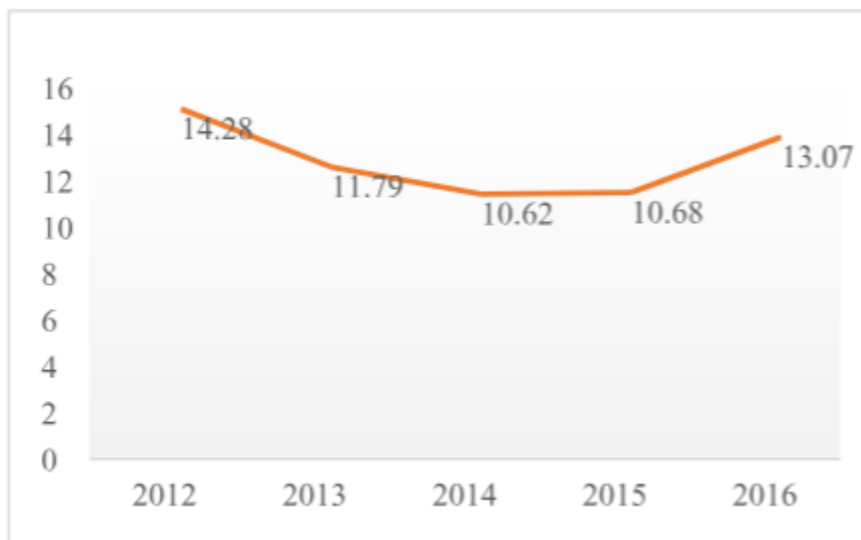
IV Data analysis:

a)Ratio analysis:

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 resources.

The ROA of Islamic banks was 1.48 in 2012 which was in decrease trend till 2015. In 2016, the ratio was 1.08 which means banks have good revenue that it can be used to cover their short term obligation

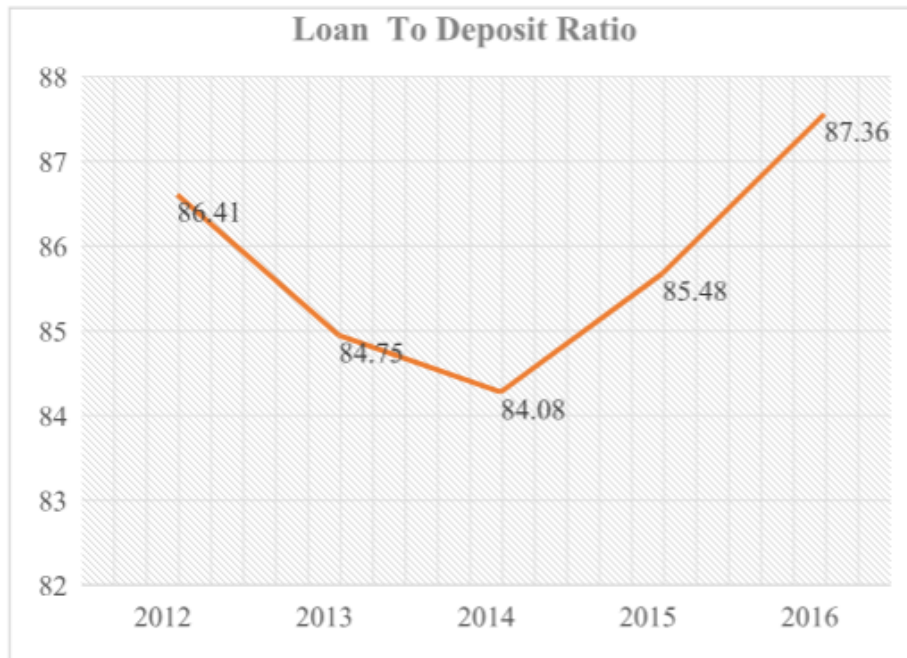


Source: Annual Report of the sample banks during the period of 2012 to 2016

Return on Equity:

The return on equity is measured as the ratio of net income to total equity. The high ratios indicate the better return to the investments of the shareholders.

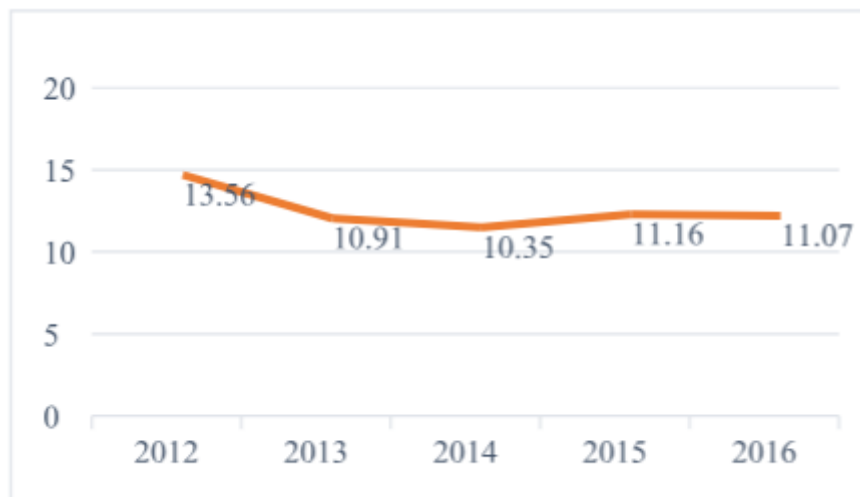
The ROE Ratio of Islamic bank was 14.28 in 2012 but in 2013, it was 11.79. It was declining trend till 2015 and in 2016 it was slightly increased from 2013. This means that the external source of fund of Islamic Banks requires higher cost and it decreases profitability.



Source: Annual Report of the sample banks during the period of 2012 to 2016

Loan -To-Deposit Ratio:

The Loan -to-deposit ratio (LTD) is found by dividing the bank's total investment by its total deposits. This number is expressed as a percentage. High ratio indicates lack of liquidity for the banks to meet the funds necessity, the low row indicates lack of earning of banks than expected. The trend of this ratio was increasing from 2014 to 2016, but it was decreasing from 2012 to 2016



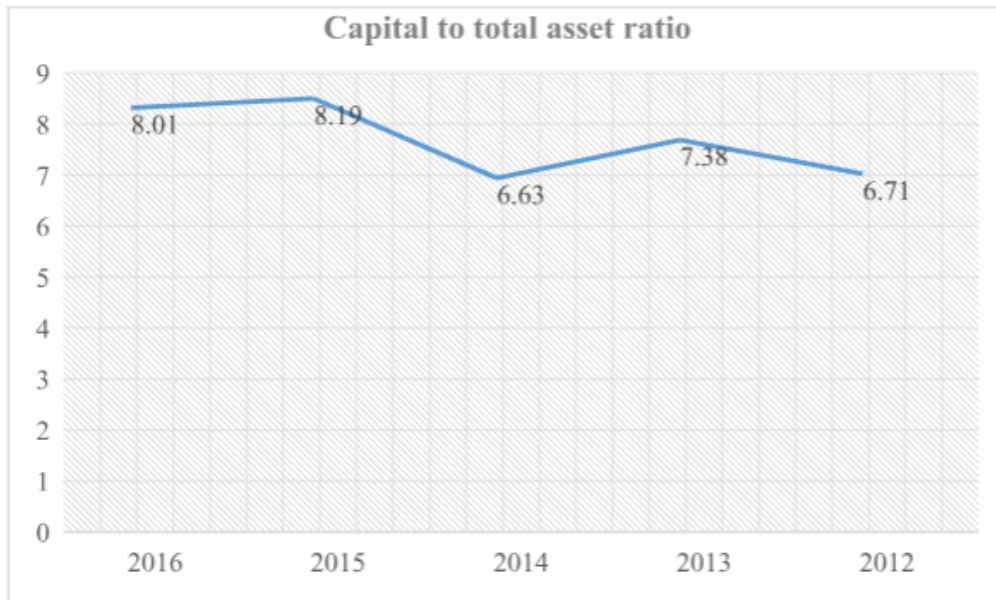
Source: Annual Report of the sample banks during the period of 2012 to 2016

In 2016 the ratio is 87.36% which means that Islamic Banks don't have enough liquidity to cover unforeseen fund requirements.

Liquidity Risky asset to total asset:

The liquidity risky asset to total asset of the Islamic banks is measured by using the cash and cash equivalent to total assets. The high figure of the ratio indicates the better liquidity position.

According to the figure, Islamic Banks had the highest cash and cash equivalent asset in 2012. The trend of this ratio was decreasing from 2012-2016.



Source: Annual Report of the sample banks during the period of 2012 to 2016

Capital to total asset ratio:

Capital to total asset is found by dividing total equity to total asset. It measures the capital adequacy of an organization. It indicates the company position in terms of capital.

Source: Annual Report of the sample banks during the period of 2012 to 2016

From the graph it is seen that capital to total asset ratio was decreasing in 2014 and 2016 compared to 2013 and 2012. It gives an indication capital adequacy of Islamic banks is decreasing.

b) Descriptive statistics:

Descriptive Statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
ROA	5	.51	.96	1.48	1.1257	.20079
ROE	5	3.67	10.62	14.28	12.0883	1.58136
Loan to deposit ratio	5	3.28	84.08	87.36	85.6137	1.30225
Liquid asset to total asset	5	3.21	10.35	13.56	11.4110	1.24031
Capital to asset ratio	5	1.56	6.63	8.19	7.3840	.71839
Valid N	5					

Analysis: In the descriptive statistics section minimum, maximum, mean and Standard deviation is shown. Range shows the difference between highest and lowest number. Minimum represents lowest value and Maximum represents highest value. Mean is found by dividing number of observations to average value of all the observations. Standard deviation measures the amount of risk involved. SD also shows the spread available in data. Here for all factors standard deviation is low which is a good indicator that there is less risk involved.

b) Correlation:

Correlations						
		ROA	ROE	Loan to deposit ratio	Liquid asset to total asset	Capital to asset ratio
ROA	Pearson Correlation	1	.864	.388	.927 [*]	.457
	Sig. (2-tailed)		.059	.518	.024	.439
	N	5	5	5	5	5
ROE	Pearson Correlation	.864	1	.747	.821	.350
	Sig. (2-tailed)	.059		.147	.089	.564
	N	5	5	5	5	5

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	N	5	5	5	5	5
Loan to deposit ratio	Pearson Correlation	.388	.747	1	.497	-.058
	Sig. (2-tailed)	.518	.147		.395	.926
	N	5	5	5	5	5
Liquid asset to total asset	Pearson Correlation	.927*	.821	.497	1	.553
	Sig. (2-tailed)	.024	.089	.395		.334
	N	5	5	5	5	5
Capital to asset ratio	Pearson Correlation	.457	.350	-.058	.553	1
	Sig. (2-tailed)	.439	.564	.926	.334	
	N	5	5	5	5	5

*. Correlation is significant at the 0.05 level (2-tailed).

Analysis: Correlation shows the relationship between independent and Dependent variables. All the liquidity measures such as loan to deposit ratio, liquid risky asset to total asset and Capital to total asset have a positive relation with independent variable ROA and ROE. Positive relation means if Independent variable ROA and ROE increases then dependent variable loan to deposit ratio, liquid risky asset to total asset and Capital to total asset will also increase. On the other hand if Independent variable ROA and ROE decreases then dependent variable loan to deposit ratio, liquid risky asset to total asset and Capital to total asset will also decrease.

c) Regression analysis (Based on ROA):

Model Summary ^b										
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	.938 ^a	.880	.519	.13927	.880	2.438	3	1	.433	2.531

a. Predictors: (Constant), Capital to asset ratio, Loan to deposit ratio, liquid asset to total asset

b. Dependent Variable: ROA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.142	3	.047	2.438	.433 ^b
	Residual	.019	1	.019		
	Total	.161	4			

a. Dependent Variable: ROA

b. Predictors: (Constant), Capital to asset ratio, Loan to deposit ratio, liquid asset to total asset

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.617	5.804		.279	.827	-72.127	75.361
	Loan to deposit ratio	-.026	.069	-.166	-.369	.775	-.907	.856
	Liquid asset to total asset	.178	.087	1.097	2.035	.291	-.931	1.287
	Capital to asset ratio	-.045	.131	-.159	-.340	.791	-1.709	1.620

a. Dependent Variable: ROA

Effect of Liquidity Risk on Performance of Islamic banks in Bangladesh:

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.0100	1.4586	1.1257	.18832	5
Residual	-.12339	.04317	.00000	.06963	5
Std. Predicted Value	-.614	1.768	.000	1.000	5
Std. Residual	-.886	.310	.000	.500	5

a. Dependent Variable: ROA

Regression analysis (Based on ROE):

Model Summary^b

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	.911 ^a	.830	.320	1.30438	.830	1.626	3	1	.510	2.531

a. Predictors: (Constant), Capital to asset ratio, Loan to deposit ratio, liquid asset to total asset

b. Dependent Variable: ROE

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	8.301	3	2.767	1.626	.510 ^b
Residual	1.701	1	1.701		
Total	10.003	4			

a. Dependent Variable: ROE

b. Predictors: (Constant), Capital to asset ratio, Loan to deposit ratio, liquid asset to total asset

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error				Beta	Lower Bound
1	(Constant)	-47.686	54.359		-.877	.542	-738.379	643.007
	Loan to deposit ratio	.592	.650	.487	.911	.530	-7.665	8.849
	Liquid asset to total asset	.678	.817	.532	.830	.559	-9.708	11.065
	Capital to asset ratio	.185	1.227	.084	.150	.905	-15.406	15.775

a. Dependent Variable: ROE

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	10.3217	14.1298	12.0883	1.44061	5
Residual	-1.15570	.40434	.00000	.65219	5
Std. Predicted Value	-1.226	1.417	.000	1.000	5
Std. Residual	-.886	.310	.000	.500	5

a. Dependent Variable: ROE

Analysis: In regression analysis R indicates the linear relationship between two variables. The value of R is .938 in case of ROA and .911 in case of ROE. The value is somewhat close to 1 which indicates close to perfect positive relation. ROA and ROE have close relationship with Liquidity measures. R square gives an indication

about the degree of variation between independent variables with respect to dependent variables. The value of R square in case of ROA and ROE are .880 and .830 which means 88% and 83% of dependent variables can be described by independent variables. ROA and ROE can tell 88% and 83 % about loan to deposit ratio, liquid risky asset to total asset and Capital to total asset ratio. Adjusted R square shows the closeness of data fitted with regression line. The Adjusted R square in terms of ROA is .510 and in terms of ROE is .320. 51% and 32% of data are fitted to regression line. Durbin Watson statistics tells if there is autocorrelation involved in data. The value ranges from 0 to 4 .The Durbin Watson value in terms of ROA and ROE is above 2 which indicates there is consistency in time series data and positive correlation. From the coefficient section of regression analysis, it is seen that loan to deposit ratio and capital to total asset ratio are negatively related with ROA and Liquid risky asset is positively related in ROA. In case of ROE loan to deposit ratio, liquid risky asset to total asset and capital to asset ratio are positively related with ROE.P value is greater than 0.05 indicate that the null hypothesis is accepted and alternative hypothesis is rejected .This means liquidity indicators loan to deposit ratio, liquid risky asset to total asset and capital to asset ratio have no relation with Bank performance (ROA and ROE).The result of this study is consistent with Falconer (2001), Diamond and Rajan (2005),Areffin (2012),Tabari, Ahmadi, Emami (2013); Mamatazakis and Bermapi(2014) ; Cuong Ly(2015); (Marozva 2015);Hakimi and Zaghdougi (2017).

V. Conclusion:

Banks rely on liquidity to properly run their operation. So lack of liquidity is a problem for banks. The liquidity crisis is prevalent in Banks of Bangladesh at present. Considering the importance of liquidity the study analyzed the effect of liquidity risk on 6 Islamic banks performance for a period of 2012 to 2016.The study found that the liquidity indicators have negative relationship with Bank performance. So there is requirement of further study to see the reason of this type of results.

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Appendix:
Data of Islamic Banks :

	Islamic	Exim	First security	Shahjalal	Social	Al Arafah	Average
ROA							
2016	0.59	1.09	0.51	1.02	2.06	1.23	1.083333333
2015	0.48	0.84	0.31	0.98	2.08	1.08	0.961666667
2014	0.67	1.15	0.38	0.59	2.36	1.1	1.041666667
2013	0.96	1.04	0.42	1	1.67	1.31	1.066666667
2012	1.27	1.4	0.69	1.44	2.75	1.3	1.475
ROE							
2016	9.28	11.78	13.11	12.4	16.16	15.67	13.06666667
2015	7	8.68	8.81	10.78	16	12.82	10.68166667
2014	9	11.34	8.29	6.6	15.68	12.8	10.61833333
2013	11	10.18	11.74	12.67	11.01	14.15	11.79166667
2012	14	13.43	13.36	17.01	14.05	13.85	14.28333333
Liquid risky asset to total asset							
2016	797699.7	291133.9	301669.25	167245	227704.2	272900.04	343058.6733
2015	725821.1	265148.4	256604.94	137870	180112.1	229106.66	299110.5417
2014	652422	232834	204876.46	126758	1537375	210439.01	494117.3533
2013	547229.6	195542.3	162033.22	128554	126616.6	173161.63	222189.5483
2012	482536.3	166997.9	129937.81	132823	115166	149320.36	196130.2283
Loan to deposit ratio							
2016	86.43	89.38	82.43	85.98	91.41	88.5	87.355
2015	83.59	87.22	81.15	82.77	89.54	88.59	85.47666667
2014	79.88	88.84	83.72	80.82	86.64	84.58	84.08
2013	82.35	86.79	82.14	84.32	84.15	88.74	84.74833333
2012	85.18	84.22	87.62	89.64	81.23	90.56	86.40833333
Capital to total asset ratio							
2016	5.86	9.09	3.57	7.69	6.23	7.81	6.71
2015	6.54	9.47	3.78	8.89	7.19	8.4	7.38
2014	7.15	9.87	4.09	9.23	0.78	8.63	6.63
2013	8	10.48	4.08	8.52	8.75	9.29	8.19
2012	8.24	9.91	4.4	7.26	8.84	9.41	8.01

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