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By M. Saifullah Khalid, Md. Rashed & Alamgir Hossain
BRAC University

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The Impact of Liquidity Risk on Banking Performance: Evidence from the Emerging Market

M. Saifullah Khalid [α], Md. Rashed [σ] & Alamgir Hossain [ρ]

Abstract- **Liquidity crisis is severe in Bangladesh commercial Banks and eventually some commercial banks suffered due to higher default and liquidity problem. This paper aims to empirically study the relationship between liquidity and financial performance of Commercial banks in developing country like Bangladesh. The investigation has been performed using panel data procedure for a sample of Dhaka stock market enlisted all commercial banks (31) during the year of 2010-2017. Our result shows that liquidity has no significant and positive or negative impact on return on asset (ROA), return on equity (ROE) as financial performance. Liquidity risk behaves in equivalent ways in different dependent variables.**

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I. Introduction

Liquidity and bank performance are prime components in deciding the endurable, development, supportability, and execution of a banking industry (Edem, 2017). Liquidity is the capacity of the monetary institution to meet all their commitment associated with the need for reserves (Yeager & Seitz, 1989; Gitman, 2009). This study explores the effect of liquidity risk on banking performance. The motives are possible to have a presence scenario of banking performance which is the key objective of the study. Liquidity risk is the opportunity of terrible consequences on the activity of proprietors, clients and different partners of the monetary institution coming about from the failure to demand contemporary fees commitment in a convenient and cost-effective process except obtaining inadmissible hardships (Paul Tsi, 2018). Banks are especially inclined to liquidity risk due to the part in changing maturities and presenting ensures in arrange to demand the liquid funds of their contributors (Diamond & Dybvig, 1983; Rauch et al., 2008). Liquidity risk emerges when a bank is the failure to suit diminishes in liabilities or to finance increments in resources. An illiquid bank cannot get adequate reserves due to the aid of expanding liabilities or to change over resources at a sensible taken a toll (BCBS, 1997). In the current situation, liquidity threat has performed a vital function in banking quandary in the world (Kim Cuong Ly, 2015). In the 2007 monetary crisis in the world, the bank was fizzled when monetary crisis ascended because of destitute liquidity administration and depends on temporary discount reserving that was the reason of the failure of a wide variety of banks e.g. Lehman Brothers and Northern Rock (International Monetary Fund, 2011). Liquidity risk has arisen as like extreme trouble and dissent for the present-day time banks. The factors that imply financial institution liquidity chance consist of destitute resource attributes, below average liquid resources, rising financial operation cost whereas assimilate to reserve resources, concentration in subsidizing origin and reliance on deposits and their vendors (Comptroller of the Currency, 2012). A bank can be failed with adequate funds, solid profit, and great resources in case it cannot hold adequate liquidity (Crowe, 2009). However, a bank which has a higher contribution to retaining liquidity threat coming about from liquidity creation (Bhattacharya & Thakor. 1993; Repullo, 2004). In fact, Liquidity risk management practices hone involve investigation of adjusting sheet to assess prospect money streams and methods subsidizing demand can be accomplished (Martha, 2013).

Author α: MBA Student, BRAC University.
e-mail: khalid.saif002@gmail.com
Author σ: BBA Graduate, IUBAT-International University of Business Agriculture and Technology. e-mail: krashed107@gmail.com
Author ρ: Lecturer, IUBAT-International University of Business Agriculture and Technology. e-mail: alamgir.hossain@iubat.edu

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Bank types	Number of banks	Number of branches	Total assets	Total Deposits	ROA (%)	ROE (%)	Liquidity Ratio
State-owned commercial banks (SCBs)	6	3721	3379.5	2700.6	0.21	3.45	30.4
Private commercial banks (PCBs)	40	4758	8758.3	6508.2	0.89	12.01	14.8
Foreign commercial banks (FCBs	9	69	603.9	392.8	2.24	11.31	43.8
State-owned development financial institutions (DFIs)	2	1407	317.6	273.3	-0.62	-3.07	0.0
Total	57	9955	13059.3	9874.9	0.74	10.60	19.9

Source: Bangladesh Bank Annual report 2017

II. Literature Review

Confronted with the significance of liquidity within the working and the endurance of bank and the need of agreement with respect to the components of liquidity risk, the prime objective of this study is to investigate the impact of liquidity risk determinants including return on assets(ROA), return on equity(ROE), different ratios that has a impact on banking performance in order to control the threat of risk by evading the drying of liquidity and financial disaster (Khemais & Abdelaziz, 2017). Generally, liquidity risk is measured from the balance sheet positions. Superior practices for liquidity risk calculate centered on the utilization of liquidity ratios. The ratios former studies used comprehend deposit assets to assets ratio (Bourke, 1989; Molyneux & Thornton, 1992; Barth et al., 2003; Demirguc-Kunt et al., 2003), cash assets to deposits ratio (Shen et al., 2001), and cash assets to customer & short period financing (Kosmidou et al., 2005). The superior esteem of liquidity ratio forms banksmore liquid and lower vulnerable to fizzle. Besides, a few studies exercise loans to deposits ratio (Demirguc-Kunt & Huizinga, 1999; Athanasoglou et al., 2006), net credit to clients and short period financing ratio to evaluate banks liquidity risk (Pasiouras & Kosmidou, 2007; Kosmidou, 2008; Naceur & Kandil, 2009). Thus, banks need to hold the positive rate of their credits as essential funds in an account with the central bank which is utilized basically to accomplish inter-bank obligation conjointly as protections for contributors (Edem, 2017). High liquidity risk occurs in the banking industry due to excessively withdraw the money by clients from the banks. This antagonistically influences the possibilities of banking performance by holding off would be clients and manageable buyers from the bank. As a result, the banks function decreases radically and come about in a critical lessening in benefit (Ejoh et al., 2014). The ability to finance any increments in resources and demand the commitments as they come due or the liquidity administration is crucial to the endurance and practicality for each banking corporation (Farah et al., 2017). The case of cash excess and cash shortage are the key reasons for arising the liquidity risk of a banking organization. Banks confront liquidity threat when ambiguity over their sufficiency emerges at the renegotiating period (Basel committee on banking supervision, 2000). It implies that when cash sources surpass cash consumption, it makes liquid treasury and when the cash consumption surpass money sources, it makes liquidity shortage. This could create a bank incapable to diminish the debts or to gather reserves to expand the resources (Farah et al., 2017). The recent economic quandary, there is a common knowledge that banks had not completely acknowledged the significance of liquidity threat management and the indication of a certain threat for the bank and the more extensive financial practices. As such, policymakers have recommended that bank ought to keep more liquid resources than within the past, and this will offer assistance self-insure against manageable liquidity or financing challenges (Mohammed & Showvonick, 2017).

III. Research Methodology

a) Data and Variables

This study analyzed data from all state-owned commercial banks, private commercial bank's listed in Dhaka Stock Exchange (DSE) and the period of eight years (2010 to 2017),and data were collected from the annual financial statement of those bank's official website and Bangladesh banks website.

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Panel A: Sample size	
Number of banks	57
Less: banks without available information	26
Total banks under the study	31
Panel B: Category-wise distribution	
State-owned commercial bank	2
Conventional private commercial bank	22
Islamic private commercial bank	7
Total banks under the study	31
Panel C: Bank-year observations	
Bank-year observations consideration for the study: 31 banks 8 years (2010-2017)	248 bank-years

Two banking financial performance indicator and two liquidity measurement variables were selected to identify the liquidity impact on the banking financial performance. Returns on asset (ROA), return on equity (ROE) were chosen as the financial performance indicators, previous literature also analyzed to select those variables (Alkhatib and Harsheh 2012, Almumani 2013, Roman and Sargu 2014). Here, previous literature (Chowdhury et el nd., Ferrouhi 2014., Edem 2017) was analyzed to determine the liquidity measurement variable of this study. These variables are Cash to Deposit Ratio (CDR) and Loan to deposit ratio (LDR).CDR used to measure bank's liquidity in the case that the bank cannot borrow from other banks; high CDR ratio means that the bank is able to cope long term liquidity risk. Another variable is Loan to deposit ratio (LDR), indicates the relationship of illiquid assets and liquid liabilities. When this ratio is high, it means that the bank is less liquid. Equity over total asset ratio (ETA) act as a control variable and which measures the capital adequacy of an organization. It indicates the company position in terms of capital.

b) Empirical Model

A primary empirical model (i) was developed to explore the liquidity impact on banking financial performance of Bangladesh, in this primary model in equation (i), the dependent variable was financial performance of Banks(BFP) and the independent variable was liquidity risk (LR) and there is an error term (€). Where, α was the intercept and which was unknown for all banks and t is time (t= 2010-2017).

$$BFP_{c,t} = \alpha + \beta_1 LR_{c,t} + €_{c,t} \ldots\ldots \text{(i)}$$

Equation (ii), (iii) are extension form of primary empirical model (i), since we have considered three different banking financial performance (ROA), (ROE) those were placed as dependent variable for bank c in time t at equation (ii), (iii) respectively.

$$ROA_{c,t} = \alpha + \beta_1 LR^{CDR}{}_{c,t} + \beta_2 LR^{LDR}{}_{c,t} + \beta_3 ETA_{c,t} + €_{c,t} \ldots\ldots \text{(ii)}$$

$$ROA_{c,t} = \alpha + \beta_1 LR^{CDR}{}_{c,t} + \beta_2 LR^{LDR}{}_{c,t} + \beta_3 ETA_{c,t} + €_{c,t} \ldots\ldots \text{(ii)}$$

Where β_1 and β_2 respectively represent the regression coefficient of liquidity risk as independent variables of cash to deposit ratio (CDR), loan to deposit ratio (LDR), for bank c in time t, and there is error term $€_{c,t}$. Ordinary Least squire- OLS, FE- Fixed effect model and RE- Random effect model are used to test the static model, those models are exploring specifically the impact of variables toward the performance and those models are also assist to explain the different variables discretely.

c) Descriptive statistics

Below table1 present the descriptive statistics of the variables, where return on asset in average 0.03 and in case of return on equity is 0.12, CDR in average 1.01, Average CDR and LDR indicate Bangladeshi banks are highly liquidate to pay off its creditors and loan is more than its deposit. Standard error for ROA, ROE, are very less but CDR, LDR, ETA is high. Std. deviation of SDR and LDR are highly deviated. Kurtosis of return on asset, CDR, LDR and ETA shows distribution has lighter tails and flatter peak.

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Table 1: Descriptive statistics of variables

	ROA	*ROE*	*CDR*	*LDR*	*ETA*
Mean	0.031336	0.126603	1.021148	7.726106	0.187553
Standard Error	0.013117	0.004823	0.45535	4.021918	0.048726
Standard Deviation	0.192785	0.070878	6.692248	59.10989	0.716116
Sample Variance	0.037166	0.005024	4.78618	3.979	0.512823
Range	2.5338	0.4355	9.224	8.1921	9.8558
Minimum	-0.0997	0.0017	0.0053	-0.1272	-0.8868
Maximum	2.4341	0.4372	9.2293	8.0649	8.969
Count	216	216	216	216	216

d) Correlations

In table2 correlation matrix between variable are presented, it's appeared that return on asset and return on equity are weakly correlated, strong correlation between return on asset and ETA are visible, CDR and ROA are weakly and negatively correlated, LDR and ROE also negative and weakly correlated. ETA is strongly and positively correlated with the ROA but with ROE relationship is too week and with CDR it's negative and weak. ETA also too weak with LDR as well as negatively related.

Table 2: Correlation matrix of variables

	ROA	*ROE*	*CDR*	*LDR*	*ETA*
ROA	1				
ROE	0.188098	1			
CDR	-0.0109	0.020454	1		
LDR	0.019401	-0.03146	0.002974	1	
ETA	0.868412	0.057531	-0.02167	-0.00639	1

IV. Empirical Findings

Table 3 presenting the result of multiple regression between liquidity risk and financial performance variables, in this table 3 a comparative result analysis model was developed to illustrate the probable impact of liquidity variable toward the financial performance of Bangladeshi banks, this model consists through three different test results Ordinary Least Squire-OLS, Fixed effect, Random Effect, this model will be used to identify the impact in two phase, first phase liquidity impact on dependent variable as return on asset (ROA), second phase dependent variable as return on equity (ROE).

Table 3: Comparative Result Analysis

ROA Dependent Variable		OLS			FE			RE		
	Variable	*β*	t	P	*β*	t	P	*β*	z	P
	Intercept	-.018	-3.44	0.001	-.02	-5.22	0.000	-.019	-2.96	0.003
	CDR	.00018	0.26	0.793	-.00	-0.46	0.648	-.0001	-0.21	0.834
	LDR	-.0001	-0.18	0.861	-.00	-0.41	0.683	-.00	-0.26	0.794
	ETA	.235	34.95	0.000	.252	42.3	0.000	.244	39.35	0.000
	R-Squared	0.8624								
	F Test	407.32						Wald Chi2(3) = 15.68		
	Adj R-sq	0.8603			Hausman Chi2 (3) = 31.73					

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					Hausman Prob>Chi2= 0.0000					
ROE Dependent Variable		OLS			FE			RE		
	Variable	β	t	P	β	t	P	β	z	P
	Intercept	.126	23.87	0.790	.125	23.6	0.00	.126	21.94	0.000
	CDR	.0001	0.27	0.652	.00	0.18	0.858	.001	0.23	0.815
	LDR	-.0003	-0.45	0.425	-.00	-0.34	0.732	-.004	-0.44	0.659
	ETA	.005	0.80	0.000	.009	1.26	0.208	.006	0.89	0.371
	R-Squared	0.0046								
	F Test	0.30						Wald Chi2(3) = 1.03		
	Adj R-sq	-0.01			Hausman Chi2 (3) = 3.91					
					Hausman Prob>Chi2= 0.2709					

In first phase of the model this study tried to identify the liquidity behavior towards return on asset (ROA), OLS test indicate CDR ratio have no impact on the return on asset significantly and positively related and LDR ratio negatively behave on the asset with high insignificance, In the meantime ETA were statically and highly significance towards the assets and ETA has positive impact on ROA. Between fixed effect and random effect model Hausman test shows fixed effect model were most appropriate to explain the impact. In Fixed effect it was visible that LDR and CDR are positively related with asset but level of significance was critically low. Though Hausman test didn't trigger the random effect model but comparative issue of the study it can be said that any variable of this model wasn't statically significant except the ETA. OLS model was the most perfect by comparing fixed and random effect model. This staticall analysis didn't show any strong evidence that liquidity has impact on the banking performance as dependent variable ROA.

Subsequently analyzing the second phase, this study found liquidity variable have no significant impact toward the ROE in case of OLS test but fixed effect and random effect shows there is several influences but statically insignificance at all. Hausman test shows the random effect model was more appropriate for explain the effect of liquidity variable rather than fixed effect model. But there was same reflection of first phase on the second phase were evident.

Overall evaluation of this study found that liquidity has no significant and positive or negative impact on return on asset (ROA), return on equity (ROE) as financial performance. liquidity behave in equivalent ways in different dependent variables.

V. Conclusion

This paper investigated the impact of liquidity on Bank's financial performance, and has been tried to get the relationship between liquidity and financial performance of banks in the Bangladesh perspective. In order to conduct the experiment Dhaka Stock Exchange enlisted banks were selected. In a nutshell, from the research it can say that liquidity has no significant impact on return on asset (ROA) and as well as return on equity (ROE) as financial performance. Researcher's related with research also believe that further research is required to justify the empirical findings of this research.

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