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Nexus between Liquidity Risk Management and Bank Performance: Evidences from Selected Commercial Banks of Bangladesh

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Abstract:
This present study aims at exploring the relationship between the liquidity risk and the bank performance for which it takes consideration of 25 commercial banks of Bangladesh with four years data of them collected from their annual reports. For this analysis random effect model of panel data was used by allowing Hausman specification test. The result reveals that liquidity risk has significant ($p<0.05$) relation with the explanatory variable bank performance, whereas bank size has positive significant ($p<0.10$) correlation and inflation rate has significant negative correlation ($p<0.10$) with bank performance. This study indicates an important tradeoff between the liquidity risk and the bank performance implying to raise the bank performance, liquidity risk must be reduced.

Key Words: Liquidity Risk, Bank Performance, Inflation, Panel Data

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I. Introduction

In most countries, especially in developing countries, banks play an important role in financing the economy and promoting economic growth. According to Bangladesh Bank, as a developing country Bangladesh has about 64 governments, Commercial, Islamic Bank. For commercial banks, it is crucial to sustain adequate liquidity to bear the various worrying events they will face. Banks with inadequate liquidity are naturally weak because they may not be ready for unexpected cash flows, resulting in large product sales. Running an asset or bank based on panic will eventually lead to huge asset loss and even bankruptcy. The risks of this liquidity are particularly evident in the economic and financial environment Turbulent flow, because in this case, the liquidity varies greatly and can dry out quickly (Zhang et al., 2020).The main functions of banks are to collect deposits, disburse loans, meet customer obligations and transfer goods and services. By doing this, banks face the risk of severe liquidity.The existence of a bank depends much on its ability of liquidity creation. Banks generally assure the demand for liquidity by depositors, different firms or organizations, also from the other banks both the long term as well as short term (Tran, 2020). In order to attract savers, banks grant the loan commitments and other off-balance sheet guarantees that's why their customers make deposits rather than consumption(Holmström et al., 2016).when depositors withdraw their deposit amount that kept in their account simultaneously bank faces liquidity risk because it cannot capable of meet up such large and quick demand.To manage such risk banks willing to sell their liquid assets or arrange withdrawals by borrowing capital from money Market (Mohammad et al., 2020).If liquidity increases, profits will decrease because there is a negative relationship between profitability and liquidity. On the other hand there exists a direct relationship between higher risk and higher return. So, the difficulty of managing liquidity lies in finding a balance between liquidity and profitability(Ndoka et al., 2016). Liquidity proportion mainly relies upon the management of a firm's cash assets and short-term assets which can be turned into cash immediate basis so that, the firms can meet their liabilities (Lalon et al., 2020).Due to the management policies maintain the bank and the trust of the customer, the effectiveness of the bank varies from bank to bank. The most important thing is to measure the bank's performance to see if there are any problems involved or not.

Chen et al., 2018 identified several factors associated with liquidity risk such as components of liquid assets and dependency on external funds, supervisory and regulatory factors, and macroeconomic factors. When a bank uses much liquid assets or different external funds causes an increase in bank's cost of funding as well as decrease in bank's profitability. Though liquidity risk may cause to lower bank profitability it also increase the bank's net interest margins. If a bank may want to run their day to day operation smoothly they have to depend much on their proportion of liquidity. Liquidity indicators such as loan to deposit ratio, liquid risky asset to total asset, capital to total asset ratio indicate that there is a negative relationship between bank performance and

liquidity indicators. (Chowdhury & Zaman, 2018). Bank will lost its bottom line performance (ROAA, ROAE and Net income) if it faces a higher liquidity gap, Where non-performing loans have a negative effect on bottom line performance. On the other hand, Net Interest Margins (NIM) has a positive effect on the bank's top line performance.(Madhuwanthi & Morawakage, 2019) also, suggest that in order to fulfill the better performance and avoid negative impact bank's need to cut down its non-performing loan ratio as well as sustains the liquidity gap at a safe level. In both the long term and short term profitability of commercial banks in Kenya were negatively affected by net stable funding ratio (NSFR) also the liquidity coverage ratio cannot able to influence the financial performance at all. (Muriithi & Waweru, 2017) finally identifies that liquidity risk has a negative effect on financial performance of those commercial banks. Generally, a bank's earnings and capital structure may adversely affect by its liquidity crisis. According to (Arif & Nauman Anees, 2012) Bank profitability is significantly manipulated by liquidity risk. While this study considers two factors of liquidity risk such as liquidity gap and non performing have a negative relation with profitability by applying multiple regressions analysis. (Ly, 2015) Found a negative relationship between liquidity risk ratio and bank performance that means while a bank maintains a high level of liquid assets they are less capable of earn higher profit. In their study find out different factors that affect the bank performance either positively (capital strength, composition of asset side and liabilities side, OBS activities, concentration, assets of the banking sector to GDP) or negatively(Bank size, income diversification, and efficiency in expense management, GDP growth, market capitalization to GDP and foreign ownership). This study found out that bank profitability positively related to capital strength including both regulatory and equity capital, loan intensity (liquidity). Where also the non-interest income has a positive impact on ROA (Return on Asset) and ROE (Return on Equity) (Rahman et al., 2015). The study identified different internal factors such as bank liquidity risk loan dep (loan deposit ratio), credit risk, capital risk(EQTA), and bank efficiency (OPEXTA) which have a significant effect on controlling banks profitability (Samad, 2015). Considering the liquidity as market liquidity risk and funding liquidity risk (Marozva, 2015) found that net interest margin and funding liquidity risk were different from each other means a negative relationship exists. In the long run, he cannot find any direct linkage between funding liquidity and credit risk.(Hakimi & Zaghdoudi, 2017) reveals that beside liquidity risk international financial crisis and inflation also have a negative effect on bank performance. Their study suggests that though liquidity risk reduces bank performance, the government, banks also the policymaker have to pay much attention regarding liquidity risk. They also suggest how the banks can minimize their liquidity risk, as well as the Tunisian government, should repose the macroeconomic environment in order to attract more depositors and investors also. In order to increase profitability banks need to depend much on liquidity and capital, deposit value, and non-performing loans (Islam & Shohel Rana, 2019).

II. Material And Methods

This study was conducted on secondary data collected from annual reports of the 25 selected commercial banks on four years panel data from 2016 to 2019 where three banks were public owned and the rest was the private banks indicated in figure 1 as 12% of public and 88% of privately running. The collected data were analyzed with statistical software STATA.

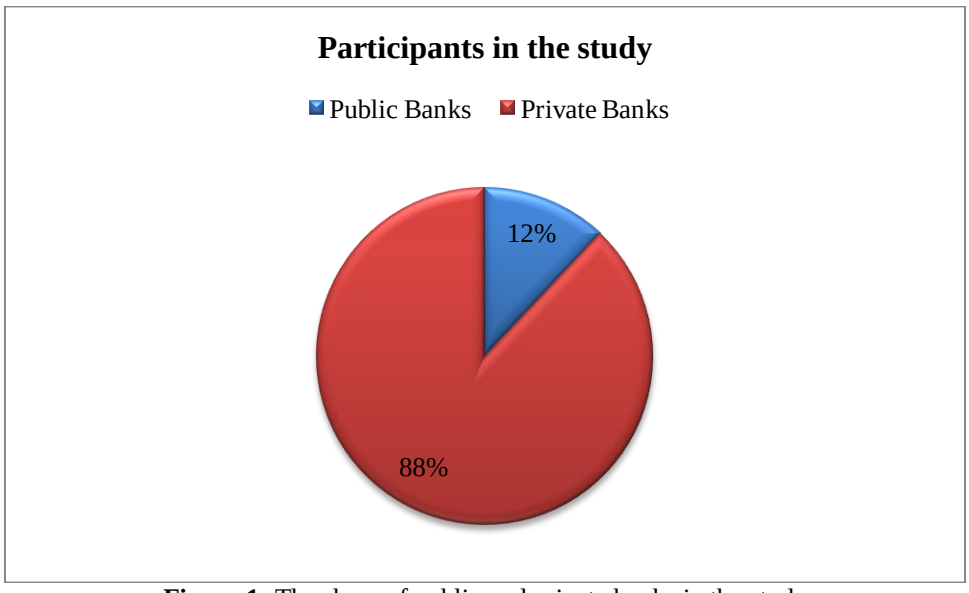

Figure 1: The share of public and private banks in the study

Analytical technique

For analysis of panel data, two models were used namely fixed effect and the random effect model. In this study random effect model was used due to its acceptance and tested by the hausman test. The model is as below:

$$Y_i = \alpha + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \mu_i$$

Where Y is dependent variable, X's are the explanatory variables, α, β's are the unknown parameters to be estimated; μ is the error term and i implies 1,2,3,4…., n.

Table no 1: Variables used in Regression Model

Variables	Description	Measurement	References
Y	Bank performance	Return On Asset (ROA)	Lin & Zhang (2009), Chowdhury & Zaman (2018), Hakimi & Zaghdoudi (2017)
X_1	Liquidity risk	Ratio of total credit to total deposit	Hakimi & Zaghdoudi (2017), Song'e, (2015)
X_2	Bank size	Natural logarithm of total assets	Hakimi & Zaghdoudi (2017)
X_3	Capital Adequacy	the ratio of total equity to total assets	Musembi (2018), Hakimi & Zaghdoudi (2017).
X_4	Inflation rate	Consumer Price Index (CPI)	Hakimi & Zaghdoudi (2017), Musembi (2018).
X_5	Gross domestic product (GDP)	Growth rate of Gross domestic product	Hakimi & Zaghdoudi (2017)

Hausman Specification Test:

Hauseman specification test for random effect model on panel data was run to find out whether the postulated model was fitted suitable or not. Hausman test can be used if under the null hypothesis one of the compared models gives consistent and efficient results and the other – consistent, but inefficient, and at the same time under the alternative hypothesis the first model has to give inconsistent results and the second – consistent (Sheytanova, T. 2015).

The general form of Hausman test statistic is:

$$H = (\hat{\beta}^1 - \hat{\beta}^{11})' [Var(\hat{\beta}^1) - Var(\hat{\beta}^{11})]^{-1} (\hat{\beta}^1 - \hat{\beta}^{11}),$$

Under null hypothesis, it is $\chi^2(k)$, distributed, where *k* is the number of parameters.

Therefore the choice of the random effect model examining houseman test is stated as

H_0 : $Cov(\alpha_{it}, X_{it}) = 0$ (Exogeneity) i.e. The random effect model is consistent efficient.

H_1 : $Cov(\alpha_{it}, X_{it}) \neq 0$ (Endogeneity) i.e. The random effect model is inconsistent inefficient that implies fixed effects model is appropriate (p-value < α).

If the result is in favor of the null hypothesis, then we use the random effect model and if the result is in favor of the hypothesis then we use the fixed effect model. In this study through hausman test, the result indicates that the null hypothesis is accepted and the random effect is applicable.

III. Result and Discussion

Before regression analysis, correlation analysis was run and shown in table 1. Correlation result shows that capital adequacy is negatively related with liquidity at 5 % level of significant whereas Bank size is highly negatively correlated with liquidity and capital adequacy. The GDP is negatively correlated with capital adequacy and positively correlated with inflation at 5% level of significance.

Table no 1: Correlation of variables

	Bank performance	Liquidity	Capital Adequacy	Bank size	Inflation	GDP
Bank performance	1.00					
Liquidity	-0.0208	1.00				
Capital Adequacy	-0.0076	-0.269**	1.00			
Bank size	0.035	-0.604**	-0.339**	1.00		
Inflation	-0.033	-0.049	-0.061	0.044	1.00	
GDP	0.113	0.093	-0.325**	0.088	0.366**	1.00

** Asterisk indicates 5% level of significance.

Table 2 below summarizes the main findings of our study. The Hausman test value is 0.45 with p-value of 99% which is greater than 5%. Hence the appropriate model is the random effect model.

Table no 2: Results of Random effect regression

Explanatory Variables	**Random Effect**		
	Coefficients	**Standard Error**	**z-statistics**
Constant	0.753	4.849	0.16
Liquidity risk	-0.025**	0.016	2.44
Bank size	0.023*	0.115	1.75
Capital Adequacy	0.629	2.866	0.22
Inflation rate	-0.694*	0.686	-1.65
Gross domestic product (GDP)	0.336	4.849	1.57
R-squared		0.02	
Hausman Specification test		0.45	
Prob>chi2		0.99	
Wald chi 2		3.08	
Number of observation		100	

Note: * and ** implies 10 % and 5% level of significant respectively.

In the table The liquidity risk is negatively and significantly correlated with bank performance. An increase in the liquidty risk is associated with a decrease of performance. Traditional bank activities are based on liquidity. This result is similar to Hakimi, A., & Zaghdoudi, K. (2017), Arif & Nauman Anees(2012) and Mwangi (2014) that sates that banks with insufficient liquidity may undergo a decline of income derived from loans activity. Consequently, the interest revenues decreased which leads to a decrease in the interest margin and bank performance. Furthermore, the insufficient liquidity can reduce bank reputation and customer trust in case of non-response to a withdrawal request (Hakimi & Zaghdoudi, 2017). Bank size has significant ($p<0.1$) positive effect on liquidity and the interest rate has also significant ($p<0.10$) negative correlation with the liquidity risk. However, effect of the other variables is not significant.

IV. Conclusion

Liquidity risk plays a key role in banking system and its proper management provides better performance of banks which van not be ignored at all. In this study, from observing 25 banks of Bangladesh and their annual reports, it is seen that the liquidity risk negatively affects (-0.025) the bank performance. It provides an important policy implication to the policy makers that to raise bank performance or profitability; liquidity risk must be reduced specially in case of developing countries like Bangladesh. However this study is limited with only 25 banks due to time and financial limitation whereas further study with large area and time can be conducted.

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