Liquidity Risk: Comparison between Islamic and Conventional Banking

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Abstract:

The purpose of this study is to analyze the influence of micro-economy or bank-specific to the liquidity risk in Islamic and conventional banks. The data in this study using secondary data consists of 20 Islamic banks and 12 conventional banks obtained from seven countries, namely Albania, Saudi Arabia, Bahrain, Malaysia, Dubai, Qatar and Indonesia from 2009 to 2015.

This research method is based on quantitative techniques using panel data regression. The results showed that in the Islamic and conventional bank found the best model is the fixed effect model. The variables that affect the liquidity risk in Islamic banks are the CAR, FEXP, FLP and NPF. While the variables that affect liquidity risk in conventional banks are FEXP, FLP, NPL and ROA.

In Islamic banking NIM, ROA and SIZE does not affect the liquidity risk, and CAR, NIM and SIZE not affect the liquidity risk in Conventional banks.

Keywords: Liquidity risk, micro-economy/bank specific, Islamic bank , conventional bank

JEL Classification: M41, M42

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1. Introduction

Activity in the banking world is a daily business transactions carried out makes it vulnerable to the risk. Some of the risks that must be faced by banks are liquidity risk, credit risk, market risk, interest rate risk, operational risk, and others. Of the many risks faced by banks, the most crucial risk is liquidity risk. Because when there is a shortage of bank liquidity, the bank cannot run a business activity and if this takes place constantly, the bank will experience the event of bankruptcy. According to Hassan *et al.* (2013) bank will experience the risk of failure and bankruptcy if banks suffer losses on the capital (Suryanto and Ridwansyah, 2016).

The global financial crisis that occurred in 2007 - 2009 was the crisis in the US that affected the whole world. In this crisis, many banks went bankrupt due to liquidity as one of the oldest and largest investment bank in the United States is Lehman Brothers. In this same crisis, the banking sector asked for help of liquidity fund in order to continue its business and to prevent the rush which can lead to a crisis plunge deeper.

Islamic banking increasingly showed its existence by being the only bank that did not ask for funding liquidity when the crisis struck. This was a good signal for Islamic banking to be recognized by worldwide for being one of the financial institutions that are resistant to the crisis. However, this does not mean that Islamic banks are completely free from the liquidity risk, because running a different banking system will also have different liquidity problems (Sukmana and Suryaningtyas, 2016; Suryanto, 2016a; 2016b).

According to Hassan (2013) a substantial difference between conventional and Islamic banks lies in the contract, namely conventional banking liquidity instrument based on the debt, while Islamic banking liquidity instrument based on the equity. According to Khan and Ahmad (2001) liquidity risks faced by Islamic banking is more important than operational risk and risk rate of return to keep it going. Because according to Amr El Tiby (2010) there are several factors that could lead to the liquidity risk in Islamic banks, namely the limited of money market instrument in between Islamic banks, a limited Islamic financial instruments in the secondary market, and the widely available in the secondary market is the conventional financial based on interest into a ban on the Islamic financial system. It makes Islamic banking has become more limited in terms of getting funding liquidity.

Several studies have examined the relationship between liquidity and micro-economy. Thalassinos *et al.* (2015) have analyzed variables affecting the performance of conventional banks. How *et al.* (2005) examined the size, capital and debt volatility. Akhtar *et al.* (2011) investigated about size, networking capital, ROE, ROA and CAR. Arif and Anees (2012) have examined the profitability and recognizing the liability gap. Iqbal (2012), Anam *et al.* (2012), Ramzan and Zafa (2014) and Nimsith *et al.* (2015) have examined the capital, efficiency and financial

performance. Sukmana and Suryaningtiyas (2016) examined the ROA, CAR and NPF / NPL. In this study, the research focuses on CAR, FEXP, FLP, NPF / NPL, NIM, ROA and SIZE by comparing the relationship of these variables between Islamic banks and conventional banks. From the literature above, the purpose of this study is to analyze the influence of micro-economy or bank-specifics to liquidity risk in Islamic banks and conventional banks.

2. Data and Methodology

In this study, the data used has been taken from the respective websites of the banks. The data sourced from seven countries, namely Albania, Saudi Arabia, Bahrain, Malaysia, Dubai, Qatar and Indonesia, which consists of 20 Islamic banks and 12 conventional banks for the period 2009 to 2015.

Table 1. *Islamic and Conventional Bank Data*

No	Name of Country	Number of Islamic Bank	Number of Conventional Bank
1	Albania	1	0
2	Saudi Arabia	2	1
3	Bahrain	3	0
4	Malaysia	5	2
5	Dubai	1	0
6	Qatar	1	0
7	Indonesia	7	9
	Number of Bank	20	12

The design study is a quantitative design. The analysis uses panel data regression analysis with the equation model as can be seen below.

3. Results and Discussion

Table 2 and 3 summarizes the value of correlations for all variables used. The test identifies a few variables that have a relatively high correlation with the correlation values above 0.8.

Table 2: *Pairwise Correlation Matrix of Variables (Islamic Banking)*

	LR	CAR	FEXP	FLP	NIM	NPF	ROA	SIZE
LR	1.0000							
CAR	0.1428	1.0000						

FEX	-0.2641	-0.4986	1.0000				
FLP	0.0065	-0.1935	0.0519	1.0000			
NIM	0.2813	-0.0585	0.2883	-0.1872	1.0000		
NPF	-0.0271	-0.0482	-0.2086	0.5211	-0.2915	1.0000	
ROA	0.1181	-0.0051	-0.0022	-0.1234	0.0275	-0.1413	1.0000
SIZE	0.0214	-0.3070	0.1089	-0.0360	-0.1914	-0.1956	0.0991	1.0000

Table 3: *Pairwise Correlation Matrix of Variables (Conventional Banking)*

	LR	CAR	NPL	ROA	NIM	FLP	FEXP	SIZE
LR	1.0000							
CAR	0.1690	1.0000						
NPL	0.2520	-0.0063	1.0000					
ROA	-0.0345	-0.0718	-0.1998	1.0000				
NIM	-0.3582	0.0963	0.0134	0.4970	1.0000			
FLP	-0.0005	0.0075	0.0117	0.3421	0.3526	1.0000		
FEXP	-0.6600	-0.0862	0.1425	-0.0976	0.3116	0.0830	1.0000	
SIZE	-0.0733	0.0898	-0.3186	0.7272	0.2041	0.4046	-0.0897	1.0000

In detecting no correlation between the independent variables the way to do it is to look at the test results in the Tables above with a value of less than 0.8. Multicollinieriety test results indicate that the overall variable has no multicollinieriety, which means that there is no correlation among variables, as the overall value of the variable of the test results <0.8.

4. Islamic Banking Estimated Results

Table 4 shows the results of the regression for Islamic Banking. The first column of the basic model is the effect of Bank Specific Variable (BSV) on Liquidity Risk (LR) using Pooled OLS. Results obtained from the BSV have no significant effect except for FEXP (Financial Expansion), NIM (Net Income Margin) and SIZE (company size) variables. In addition, the result of goodness of fit on seven BSV to LR is only 0.2575 which is the value of R^2 or the seventh BSV to LR is only 25.75% using Pooled OLS model.

Tabel 4. *Islamic Banking Estimated Results*

Independent Variable	Dependent Variable : LIQUIDITY RISK ISLAMIC BANKING

	POOLED OLS		FIXED EFFECT		FIXED EFFECT		RANDOM EFFECT	
Variable	Coeff	Prob	Coeff	Prob	Coeff	Prob	Coeff	Prob
CAR	0.0758	0.5564	0.0034	0.9531	0.0570	0.0512	0.0033	0.9538
FEXP	-0.4451	0.0000	-0.3209	0.0001	-0.1027	0.0723	-0.3270	0.0000
FLP	1.1892	0.2125	0.9673	0.0946	1.0857	0.0054	0.8799	0.1126
NIM	4.1016	0.0000	-0.3383	0.4500	-0.0211	0.9459	-0.0421	0.9226
NPF	0.1609	0.5300	0.0944	0.3238	0.1518	0.0003	0.0843	0.3725
ROA	1.0882	0.1530	-0.0802	0.7559	-0.3045	0.2063	-0.0663	0.7945
SIZE	0.0000	0.0429	0.0000	0.2032	0.0000	0.6874	0.0000	0.1500
C	0.5136	0.0000	0.6941	0.0000	0.5463	0.0000	0.6831	0.0000
R-squared	0.2575		0.9445		0.9860		0.2551	
Durbin-Watson stat	0.1553		1.1649		1.5443		0.9191	
Dummy Variables	no		yes		Yes		no	
GLS-Weights	no weights		no weights		cross-section weights		no weights	

Furthermore, the second and third columns represent the seven models of BSV on LR using fixed effect model. The second column, present the first fixed effect model without replacing GLS-Weights with Cross-section weight. The results obtained improved the goodness of fit to be 0.9445 or the seventh BSV affecting LR as much as 94.45% with 2 significant models at a significant level of 10%. This model can not be said to be the best until the second fixed effect model is tested by changing the GLS-weights into Cross-section weights. The results obtained have a better goodness of fit 0.9860 and resulted in 4 significant variables at significant level 10%.

While the last model in the fourth column of Table 4 is the Random Effect model producing goodness of fit of 0.2551 with only 1 significant variable at 10% significant level, namely FEXP. The selection of the model is also supported by Redundant Fixed Effect test and Hausman test which produce probability value <0.05 which means that the best model in measuring the influence of the seven BSV to LR is the Fixed Effect model. Chow test using H_0: Common Effect and H_1: Fixed Effect, if the p-value> 0.05 then accept H_0 and if the p-value <0.05, then reject H_0 is presented in Table 5 as follows.

Table 5. *Chow Test Islamic Banking*

Redundant Fixed Effect test

Equation : Untitled

Test cross-section fixed effects

Effect Test	Statistic	d.f	Prob
Cross-section F	72.94226	(19,112)	0.0000

The probability value of Cross-section is F <0,05 derived by using Chow test therefore the Fixed Effect model is more precise than the Common Effect.

Table 6 presents the Hausman Test using H_0: Random Effect and H_1: Fixed Effect, if the p-value> 0.05 then accept H_0 and if the p-value <0.05, then reject H_0.

Table 6. *Hausman Test Islamic Banking*

Correlated Random Effects - Hausman Test

Equation : Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob
Cross-section random	16.47220	7.00	0.0000

The probability value of Cross-section random is <0.05 derived by the Hausman therefore it can be concluded that Fixed Effect model is more precise than the Random Effect model. It can be seen that using Chow and Hausman tests there is a harmonious result, so it can be said that the best model on liquidity risk for the dataset concerning Islamic Banking is the Fixed Effect Model.

Multiple linear regression analysis was intended to test the extent and direction of the influence of the independent variables on the dependent variable. The independent variables in this study is $CAR(X_1)$, $FEXP(X_2)$, $FLP(X_3)$, $NIM(X_4)$, $NPF(X_5)$, $ROA(X_6)$ and $SIZE(X_7)$ while the dependent variable is LR(Y). Based on calculations performed using the statistical tables on the importance of the multiple linear regression equation models we have the following:

LR = 0.546341 + 0.056994*CAR – 0.102722*FEXP + 1.085715**FLP – 0.021086*NIM + 0.151848**NPF – 0.304536*ROA – 8.98E-08*SIZE

Based on the above regression equation it is possible to analyze the influence of each independent variable on the dependent variable, namely: the constant of 0.546341

states that there is an initial effect in the dependent variable without any other influence by the independent variables. CAR has a positive effect on LR (0.056994) at significance level of 10%, FLP and NPF also (1.085715 and 0.151848 respectively) positive effect on LR at a 5% significance level. This means that, if the amount of Capital Adequacy Ratio, Quality Financing and Credit Risk increase, then the risk of liquidity will also increase. FEXP has a negative effect on LR (0.1027220 at significance level 10%. Therefore if the financial expansion increases then liquidity risk will decrease. The other variables, Net Income Margin, Profitability and Size Company do not affect the liquidity risk in Islamic banking.

The Determination coefficient has been used to determine the percentage of CAR, FEXP, FLP, NIM, NPF, ROA and SIZE of the LR. Based on the output above the Fixed Effect model has a high R-square, 0.986, meaning that all variables together have contributed 98.6% to LR while the remaining 1.4% can be explained by other variables not examined in this research.

5. Conventional Banking Estimated Results

Table 7 shows the results of the regression for Conventional Banking. The first column of the basic model is the effect of a Bank Specific Variable (BSV) on Liquidity Risk (LR) using Pooled OLS. Results obtained from the seventh BSV have a significant effect on LR. But, the result of the goodness of fit of the seventh BSV on LR is only 0.6332 therefore the effect of the seventh BSV on LR is only 63.32% using Pooled OLS model.

Tabel 7*. Conventional Banking Estimated Results*

Independent Variable	Dependent Variable : LIQUIDITY RISK CONVENTIONAL BANKING							
	POOLED OLS		FIXED EFFECT		FIXED EFFECT		RANDOM EFFECT	
Variable	Coeff	Prob	Coeff	Prob	Coeff	Prob	Coeff	Prob
CAR	0.8423	0.0125	0.1086	0.6130	0.0775	0.7069	0.2599	0.2077
FEXP	-0.5726	0.0000	-0.5655	0.0000	-0.6148	0.0000	-0.5025	0.0000
FLP	2.3308	0.0434	4.1492	0.0039	3.5583	0.0014	2.6334	0.0180
NIM	-1.6571	0.0010	-0.9173	0.2094	-0.4732	0.4123	-1.0289	0.1022
NPL	3.1277	0.0001	0.9962	0.0506	0.8638	0.0936	1.1770	0.0189
ROA	2.4928	0.0445	3.4141	0.0018	3.0570	0.0001	2.5772	0.0051
SIZE	0.0000	0.0555	0.0000	0.3136	0.0000	0.1624	0.0000	0.5938
C	0.4669	0.0000	0.4695	0.0000	0.4979	0.0000	0.4794	0.0000

R-squared	0.6332	0.9188	0.9706	0.5218
Durbin-Watson stat	0.5156	1.4570	1.5833	1.2107
Dummy Variables	no	yes	yes	no
GLS-Weights	no weights	no weights	cross-section weights	no weights

Furthermore, the second and third columns represent the seven models of BSV on LR using Fixed Effect model. The second column presents the first Fixed Effect model without replacing GLS-Weights with Cross-section weight. The results obtained improved the goodness of fit to be 0.9188 or the seventh BSV is affecting LR as much as 91.88% with 4 significant models at significant level of 10%. This model cannot be said to be the best until the second Fixed Effect model is tested by changing the GLS-weights into Cross-section weights. The results obtained have a better goodness of fit 0.9706 and resulted in 4 significant variables at significant level up to 10%, namely FEXP, FLP, NPL and ROA .

The last model in the fourth column is the Random Effect model with goodness of fit of 0.5218 with 4 significant variables at 10% significant level. The selection of the model is also supported by Redundant Fixed Effect test and Hausman test which produce probability value <0.05 which indicates that the best model in measuring the influence of the seven BSV to LR is the Fixed Effect model. Chow test using H_0: Common Effect and H_1: Fixed Effect, if the p-value> 0.05 then accept H_0 and if the p-value <0.05, then reject H_0 is presented in Table 8.

Table 8. *Chow Test Conventional Banking*

Redundant Fixed Effect test

Equation : Untitled

Test cross-section fixed effects

Effect Test	Statistic	d.f	Prob
Cross-section F	20.770644	(11,65)	0.0000

Table 8 shows that the probability values of Cross-section is F <0.05. It concluded that using Chow test the Fixed Effect model is more appropriate than the Common Effect.

The Hausman Test using H_0: Random Effect and H_1: Fixed Effect, if the p-value> 0.05 then accept H_0 and if the p-value <0.05, then reject H_0 is presented in Table 9.

Table 9. *Hausman Test Conventional Banking*

Correlated Random Effects - Hausman Test

Equation : Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob
Cross-section random	10.265716	7.00	0.0174

Table 9 shows that the probability value of Cross-section random is <0.05. So it can be concluded that the Fixed Effect model is more precise than the Random Effect model. It is clear that both tests have determined a harmonious result, so it can be said that the best model on liquidity risk for the Conventional banking is also the Fixed Effect Model. Based on calculations performed using the statistical tables on the importance of the multiple linear regression equation models we have the following:

$$LR = 0.479355 + 0.259944*CAR - 0.502519*FEXP + 2.633420*FLP - 1.028889*NIM + 1.177042*NPL + 2.577165*ROA - 2.53E\text{-}08*SIZE$$

Based on the regression equation model above it is possible to analyze the influence of each independent variable on the dependent variable. The coefficient of the constant is 0.479355 and states that if the value of CAR, FEXP, FLP, NIM, NPF, ROA and SIZE is stable then the value of the variable LR is equal to 0.479355. NPL positively affects LR at a significance level of 10%, FLP and ROA positively affect LR at a 5% significance level. This means that, if the amount of Credit Risk, Quality Financing and Profitability increase then the liquidity risk will also increase. At the same time FEXP negatively affects LR at 1% level of significance. This means the opposite, if the financial expansion increases then liquidity risk will decrease. And Capital Adequacy Ratio, Net Interest Margin and Size Company do not affect liquidity risk in conventional banks. Coefficient of determination used to determine the percentage of CAR, FEXP, FLP, NIM, NPF, ROA and SIZE attributed to LR. Based on the Fixed Effect model the R-square value is 0.9706 which means that all variables together have explained 97,06% of LR while the remaining amount 2,94% is explained by other variables not examined or not included in this research model.

Conclusion

In this study is stated that the CAR significantly influence the liquidity risk in Islamic banking but not significant in conventional banking. This is according to the research of Muharam and Kurnia (2013) which says CAR does significantly influence the liquidity risk of Islamic banks (significant level 10%). While it is not in accordance with to research by Muharam and Kurnia (2013) which states that the

CAR has a significant negative effect on the risk of liquidity in the conventional bank our research has found the opposite. FEXP variable (financial expansion) states the existence of a significant effect on the bank's liquidity risk in Islamic banks and conventional banks. This is in line with the research by Saikh (2015) which states that FEXP has a significant negative effect on the risk of liquidity. FLP (financing quality) variable suggests that there is a positive and significant effect on Islamic and conventional banks while it has a negative effect on NPF in other studies. Credit risk is a variable with a positive and significant impact on liquidity risk in Islamic and conventional banks. These results are in accordance with the research by Sukmana and Suryaningtyas (2016) and Arif and Anees (2012).

NIM variable has no effect on liquidity risk in Islamic and conventional banks. This is not in line with the research by Muharam and Kurniawan (2013) which supports the positive effect of NIM on LR in Islamic banking and has no effect on the conventional banks. ROA revealed no effect on the Islamic banking and a positive and significant impact on the conventional banks. This is consistent with the research by Akhtar *et al.* (2011) and Sukmana and Suryaningtias (2016) who have stated that ROA is a significant variable in conventional banking. SIZE variable does not affect the liquidity risks in both types of banks. This is consistent with the research by Akhtar *et al.* (2011) which states that the SIZE does not significantly influence the liquidity risk in Islamic and conventional banking.

In Islamic banking it is found that the best model is the fixed effect model while conventional banks' best model is the model of random effect. Variables that affect the risk of liquidity at Islamic banks are the CAR, FEXP, FLP and the NPF, other variables such as NIM, ROA, and SIZE no effect on liquidity risks in Islamic banks. While the variables that affect liquidity risk in conventional banks are FEXP, FLP, NPL and ROA, other variables like CAR, NIM, and SIZE no effect on liquidity risk at a conventional bank.

Suggestion

Islamic and conventional banks have the same number of risk factors. But, the factors that affect the risk on each one of the banks are different. This is due to differences in the system and returns since in Islamic banking a profit-sharing is used while in conventional banking the payment of an interest rate is used. As a system Islamic banking can be considered as a partnership while conventional banking as customer oriented system with creditors and debtors. Therefore the advice to the policy makers is to be able to prevent and manage liquidity risk by using different treatments since the factors affecting risk in the two types of banks are different.

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