

LIQUIDITY RISK UNDERLYING DEBT FINANCING AND ECONOMIC CONDITION: A PANEL DATA ANALYSIS OF ISLAMIC BANK IN MALAYSIA

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ABSTRACT

The objective of this paper is to analyze the determinants of Islamic bank liquidity risk in Malaysia with special focus on debt financing. Based on this objective, this study utilized unbalanced panel dataset of 17 Islamic banks in Malaysia over the period 1998-2012. The method use is this study is panel data regression analysis. The results show that the level of capital is significant with the liquidity risk. For debt financing variable, the results signify that the higher volatility of debt financing modes will cause some liquidity risk. For macroeconomic condition, the result shows that impact of inflation rate could decrease the nominal value deposits in Islamic bank and finally the relationship of liquidity risk and Islamic bank deposit rate is negative. The implication of this study is that when the Islamic banks consider on their liquidity risk management, they have to look upon the behaviour of debt financing, inflation rate and Islamic bank deposit rate.

Keywords: Liquidity Risk, Debt Financing, Asset Size, Islamic Bank Deposit Rate and Inflation Rate

INTRODUCTION

Liquidity risk involves a high degree of negative consequences that could affect the entire business of banking institutions and affect banks survival. Liquidity risk arises whenever the banks' customers demand immediate cash for their financial claim. The Basel Committee of Banking supervision defines funding liquidity as the ability of banks to meet their liabilities, unwind or settle their positions as they come due (BIS, 2010). Liquidity risk also revolves around the ability of a bank to maintain sufficient funds to meet its commitments, which related to its ability to attract deposits. It is about the ability of matching the maturity of assets and liabilities daily and coping with any short-term pressures that may arise in the process of ensuring the assets fully funded. Islamic banks could be exposed by the liquidity risk problem due to latest changes economic and financial developments. The ability to mitigate and control liquidity problem is important to ensure the stability of Islamic banks. The business activity that they engaged in shown that there is a need to assess liquidity issues for Islamic banks. The Islamic banking operation based on real economic activity and asset based contracts, which closely related to the economic environment, the business relationship between business partners and good conduct of the stakeholders. Thus, when there is a change of economic condition and disharmony between Islamic banks and entrepreneur, the liquidity risk might occur.

Interestingly in Malaysia, to control the liquidity risk, Islamic banks prefer debt-based financing due to the commitment to obliged the terms and conditions on the liability side such as Bai BithamanAjil (BBA), Al-IjarahThumma Al-Bay' (AITAB) and Murabahah financing. For example, up to 2012, Bai BithamanAjil (BBA), Al-IjarahThumma Al-Bay' (AITAB) and Murabahah financing cover more than 60 percent of total financing by Islamic banks (BNM, 2012). The reason from the perspective of liquidity management is that these financings cannot be turned into liquid before maturity; it lends itself to any fixing of maturity at the time of contracts. This feature is not possible in (Profit and Loss Sharing) PLS financing modes such as Musharakah and Mudarabah contracts where actual of profit to the bank is tied with the timing of the life cycle of the project. For example, the mechanism of 'floating BBA' is the customer pays a monthly installment amount that is on the higher end, but thereafter gets a rebate based on the prevailing market interest (Meera and Dzuljastri, 2009). Practically, the customer must obey and pay the financing regularly to prevent default. Hence, the problem of liquidity risk could be lower though average maturity of deposits are shorter than average maturity of Murabahah and BBA contracts or if the deposits are sensitive to changes of interest rates. For AITAB especially on vehicle financing, the liquidity risk is even lower due to the sale price is built into rental instalments. However, the rentals cannot not be drawn unless the asset is ready to provide usufruct a temporary legal right to derive profits from property owned by others, given that the property is not damaged to the lessee, and this shows that the liquidity of this contract depends on the time required in making the asset useable by the lessee after the agreement.

Unfortunately, the source of liquidity could also emanate from debt financing contracts (Salman, 2004). The explanation is that the predominance of debt-financing mode among the Islamic banks is that it is not easy to transform this type of financing into negotiable financial instruments. The liquidity risk in these contracts can arise from the nature of the contract and indirectly due to realization of the other kinds of risks (i.e credit risk and market risk) at some stage during the course of the contract. Therefore, each type of debt financing contracts depends on the direct and indirect liquidity risk associated with it on both the asset side and liability side. For example, there are two liquidity sources regarding on debt financing such as murabahah and BBA financing contracts. First, since both of these debt financing receivables are debt payable on maturity they cannot be sold at a price different from the face value in the secondary market. This is a source of liquidity risk for the bank, particularly, if the average maturities of deposits are shorter than average maturity of murabahah or BBA contracts or if the deposits are sensitive to market returns. This kind of liquidity risk happens due to the non-re-sellable nature of murabahah and BBA 'primary liquidity risk' associated with this instrument. Second, due to business and other risks associated with this instrument will also lead to liquidity risk. One of the examples is that, when the client refuses to accept the goods in these contracts, Islamic bank is stuck with the goods until another client accepts the goods later. Until they find a new client, Islamic bank has to bear the liquidity risk. Similarly, if the buyer is unable to pay the due amount on time, which is a financing risk, could also trigger liquidity risk for Islamic banks. As for Al-Ijarah contract, liquidity risk arises when the bank has to pay the price of the asset upfront to acquire the asset before it can lease the asset back to the customer. The liquidity risk depends on whether or not the asset is readily re-sellable in the market.

Finally, the relationship between banks and the economy represents an important link between financial development and economic growth. This implies that the operation of Islamic banking is also exposed to the macroeconomic environment and therefore it is also crucial to understand the effect of macroeconomic condition on liquidity risk exposure of the

Islamic banks in Malaysia. For example, interest rate movement is an important macroeconomic indicator and can cause liquidity risk problems. The movement of interest rates has a major influence on the profit-driven depositors of Islamic banks. There are several studies done regarding on the relationship between the movement of interest rates and the demand of Islamic banks' deposits. For example, studies Islamic deposits in practice are not very different from conventional deposits since the investment rates for the Islamic banks are closely pegged to the conventional deposit rates (Ahmad and Mansor, 2003; Choong and Ming-Hua, 2006; Sudin and Norafifah, 2000; Khawla and Mahmoud, 2011).

Based on the above issues, this study concerns on the factors that determine the behavior of liquidity risk especially debt financing and economic factors. Hence, this study is structured as follows: the next section subsequent the introduction, highlights the important literature. The third section defines the methodology of this study. Statistical results and analysis is illustrated in fourth section. The fifth gives the major conclusion.

REVIEW OF THE LITERATURE

Some authors argued that debt financing mode has better risk tolerance and less complicated financial risk management compared to the PLS contracts but is also not free from moral hazard and adverse selection problem (Abdel-Hameed, 1996; Khadidja & Amina, 2011; Saiful, 2011). With these two problems and in fact in Malaysia, more than 60 per cent of total financing offer by Islamic banks are debt financing modes, the debt like financing seemed to be mimicking the conventional banks and could lead to other multiple risks and specifically liquidity risk (Dzuljastri, Mustafa & Fauziah, 2008; Eddy, Ezry, Kashoogie & Anwar, 2010; Saiful, 2011; Muhammad, Khizer and Shama, 2011). The implication is that the long-term profitability of the bank adversely affected if the long-term debt financing is distorted by the default of the customers. Therefore, the greater the loan volatility (higher uncertainty), the greater the risk of not being able to fulfil the unexpected financing demands. Higher financing uncertainty will reduce the bank's capability to meet financing demands and this will increase liquidity risk. In the debt financing context, the higher debt financing modes volatility means the greater the risks of not being able to face any unexpected changes in debt financing modes. This tends to lower the Islamic banks' ability to absorb liquidity shock from the assets side. If the debt financing modes volatility is higher, then the higher the tendency for default and this will lower profitability

Another issue is that banks are unable to acquire information regarding the change of the level of their deposits at a certain time. How et al. (2005) noted that higher deposit volatility suggests instability in deposit and this is related to the uncertainty in the ability to service customer withdrawals. Of course, this situation attracts liquidity risks exposure. Higher uncertainty in deposits will reduce the capability of the bank to meet excessive withdrawals. According to How et al. (2005), the volatility of deposit can be measured by calculating the standard deviation of total deposits during the sample period divided by the average total assets.

The level of capital also affecting bank liquidity risk (How et al., 2005). However, the relationship between the level of capital and liquidity risk is unclear (Dennis and Suriawinata, 1996). There are two directions regarding of the relationship between capital and liquidity risk that explained this situation. First direction is increase in capital will increase depositor's confidence and thus lower liquidity risk where the level of withdraw ability is lower. Second direction is that increases in capital ratio will free the bank from constraints in its loan portfolio and thus increases liquidity risks. Fortunately, the depositors are insured and the amount of them is large, thus, they are probably not under influenced by changes in the

bank's capital level. Hence, it is expected that the effect of capital is more dominated to the financing portfolio and minimum effect to the liquidity risk.

The size of asset is explained from the aspects of too big to fail arguments (Chung-Hua et al., 2010). Bank with large asset would benefit from an implicit guarantee and this will decrease their cost of funding and prepare them to face more assets and risks. Thus, bank with large asset size usually provides more loans and at the same have larger liquidity based on too big to fail argument. On the asset side, it can be done by holding a significant proportion of liquid assets. Cash can be used immediately to meet liquidity needs, while government securities can be used readily as collateral. On the liability side, banks should ensure enough diversified funding sources to reduce liquidity risk.

The impact of the rate of returns on the liquidity risk focused on the movement of Islamic deposit rates. The Islamic deposit rates have had a major influence on the profit-driven depositors of Islamic banks. They may possibly have placed their deposits with conventional banks due the attractiveness of conventional interest rates compared to the profit-sharing returns offered by Islamic banks. The findings by Sudin and Norafifah (2000) showed that customers who place their deposits with saving and investment account facilities are guided by the profit motive. In other words, Islamic banks consider interest rates before adjusting its deposits returns (Ahmad and Mansor, 2003). Moreover, Choong and Ming-Hua (2006) stressed that customers are free to choose either systems and have the right to switch between systems. Consequently, though Islamic banks are operating on an interest-free basis, the economic environment of a dual banking system may expose them to the problem of rate of returns risk. The rate of returns of Islamic banks have to follow the market trend, else the Islamic banks will face liquidity problem. The impact of macroeconomic environments on liquidity risk is shown by relating two important macroeconomic variables, which are RGDP and inflation rate. Higher economic growth make banks to lend more and at the same time attract less deposit during economic expansions and increasing liquidity risk (Chung-Hua et al. 2010). While the relationship between the inflation rate and the deposit is that when inflation rate increase, it will lower the value of the investment deposits which lead banks to hold more liquid assets to absorb inflation shock (Moore, 2010).

This study provides new empirical support in order to fill the knowledge gaps on the liquidity risk determinants of the Islamic Banks in Malaysia. Therefore, study introduces debt financing as part of important determinants of Islamic banks liquidity risk. As mentioned in the introduction, the source of liquidity could also emanate from debt financing. The question is, to what extent does the debt financing affect the Islamic banks' liquidity risks? Our concern is to find out the magnitude and the strength of the relationship between the Islamic banks' liquidity risk and their determinants. This can be measured with financing volatility by calculating standard deviation of BBA and AITAB financing divided by the average total assets adapted from How et al. (2005). The greater loan volatility, the greater the risk of not being able to fulfill the unexpected financing demand. In short, the debt financing are positively related to the liquidity risk. Higher uncertainty in financing will reduce the capability of the bank to meet excessive financing demands.

DATA AND METHODOLOGY

Specific Model

Correlation and Panel data regression analysis is applied in this study and compare the effect of independent variables on the dependent variables. STATA software is used in investigating and measuring for Islamic Bank liquidity risk and the determinants.

To measure the liquidity risk or the dependent variables, the ratio are such as liquid asset to total asset (LIQA) and liquid asset to total Deposit (LIQD) and Deposit Financing Ratio (DFR) is used. The model specification follows Gonzalez-Hermosillo, Pazarbasioglu and Billings (1997), Abdel-Hameed (1999), Barth, Nolle, Phumiwasana and Yago (2003), How et al. (2005), Gonsel (2008), Chung-Hua et al. (2010) and Vodova (2012).

Model (I): Liquid Risk on Asset (LIQA)

$$LIQA = \alpha + CAR_{it} + DVOL_{it} + VOLBBAITAB_{3it} + SIZE_{it} + IDR_{it} + RGDP_{it} + INF_{it} + \epsilon_{it}$$

Model (II): Liquid Risk on Deposit (LIQD)

$$LIQD = \alpha + CAR_{it} + DVOL_{it} + VOLBBAITAB_{3it} + SIZE_{it} + IDR_{it} + RGDP_{it} + INF_{it} + \epsilon_{it}$$

Model (III): Deposit Financing Ratio

$$DFR = \alpha + CAR_{it} + DVOL_{it} + VOLBBAITAB_{3it} + SIZE_{it} + IDR_{it} + RGDP_{it} + INF_{it} + \epsilon_{it}$$

Where $I = 1, \dots, n$; $t = 1, \dots, t$

Table 1. Variables and their proxies

Symbols	Variables	Proxies
	Liquidity Risk on Asset	
	Liquidity Risk on	
LIQA		Liquid asset to total asset define as the level liquidity shock absorption capacity of a bank (Vodova, 2012 and Chung-Hua et al., 2010).
LIQD		Liquid asset to total deposit define as the level of liquid asset to pay back the trust (deposit) to the depositors (Gonsel, 2008 and Vodova 2012).
DFR		Deposit to Financing Ratio or the level of deposit runs of a bank (Gonzalez-Hermosillo et al. 1997 and Gonsel (2008).
	Deposit Financing Ratio	
Explanatory Variables		
CAR	Capital Adequacy Ratio	Capital Adequacy Ratio measured by total equity to total assets (Chung-Hua et al., 2010 and Gonsel, 2008).
DVOL	Volatility of Deposit	The standard deviation of demand and saving deposits during the sample period divided by the average total assets (How et al., 2005).
VOLBBAITAB	Volatility of Debt Financing	The ratio of standard deviation of BBA, <i>Murabahah</i> and AITAB financing during the sample period divided by the average total assets (How et al., 2005).
SIZE	Islamic Bank Size	Natural log of total assets (Barth et al., 2003).
IDR	Deposit Rate	Islamic banks 3 Month investment deposit rate (Choong and Ming-Hua, 2006).
RGDP	Economic Growth	Real GDP growth.
INF	Inflation Rate	The inflation rate.

Data

This study incorporates 17 full-fledged Islamic banks and one conventional bank with Islamic window. The Islamic banking data were extracted from the audited annual reports of 11

Islamic local banks and 7 Islamic foreign banks. The data comprises unbalanced Islamic banking data.

STATISTICAL RESULTS AND ANALYSIS

The statistical analysis of secondary data has been divided into three dimensions i.e descriptive, correlated and regression. Table 2 exhibit descriptive statistics of the explanatory variables, which show the mean, standard deviation, maximum and minimum values of Islamic Banks. Table 3 shows the Pearson’s Correlation results for the independent variables affecting the liquidity risk exposure of the Islamic banks. As seen in Table 3, there appears to be no serious correlation.

Table 2. Descriptive statistic of variables

Variable name	Mean	Minimum	Maximum	Standard deviation
LIQA	0.21	0.000038	0.870	0.188
LIQD	-1.91	-9.51	1.885	1.56
DFR	1.26	-4.56	10.09	1.25
CAR	12.36	-1.902	109.5	16.83
DVOL	0.796	0.00014	11.08	1.084
SIZE	16.06	11.36	24.07	2.770
VOLBBAITAB	0.583	0.00006	10.45	1.267
RGDP	12.45	12.08	12.75	0.211
INF	2.85	1.2	5.4	1.39
IDR	1.76	0.9515	4.78	0.87

Table 3. Correlation Matrix among independent variables

Variables	CAR	DVOL	SIZE	Vol BBAITAB	RGDP	INF	IDR
CAR	1.0000						
DVOL	-0.0135	1.0000					
SIZE	-0.0375	-0.0587	1.0000				
Vol BBAITAB	0.0382	0.0737	-0.1091	1.0000			
RGDP	0.0386	-0.0717	-0.0818	-0.1893	1.0000		
INF	0.0579	0.0695	0.0128	-0.0172	-0.3361	1.0000	
IDR	-0.0957	-0.0534	0.0086	0.3832	-0.1853	-0.2047	1.0000

Thus, all the independent variables were included in the regression estimation. Another test to determine whether the fixed effects model or random effects model is more appropriate is Hausman test. Table 4 shows that the probabilities or p-values of the Hausman test are 0.0000, 0.0004 and 0.6940 for LIQA, LIQD and DFR respectively. This means that the fixed effects model is appropriate for LIQA and LIQD. On the other hand, the random effects model is suitable for DFR.

Table 4 shows that there is a positive significant relationship between LIQA and CAR. The positive relationship between CAR and LIQA also imply that increases in capital ratio will free the Islamic bank from constraints in its financing portfolio and thus increases liquidity risks exposure. However, the positive influence of the share of capital on total assets is consistent with the assumption that Islamic banks with sufficient capital adequacy should

have the capacity to absorb liquidity shock (Mahir and Oehler, 2010). Moreover, the depositors are insured and the amount of them is large, thus, they are probably not under influenced by changes in the bank's capital level.

Table 4. The panel regression output for liquidity risk models

	LIQA (FEM)	LIQD (FEM)	DFR (REM)
Constant	-0.4119 (-1.61)	-0.088 (-3.43)***	10.694 (2.31)**
CAR	0.1852 (13.28)***	0.0342 (0.6)	-0.6526 (-0.76)
DVOL	-0.0033 (-2.5)**	0.0001 (1.22)	-0.0143 (-2.69)***
SIZE	0.0376 (2.51)**	-0.1910 (-3.14)**	0.0157 (0.51)
VOLBBAITA	0.0003 (3.35)***	-0.0593 (-1.35)	0.00146 (2.85)***
B	-0.0057 (-1.13)	0.0013 (0.06)	-0.2880 (-1.2)
RGDP	0.01093 (0.97)	0.1182 (2.57)**	-0.08312 (-1.58)
INF	-0.0352 (-1.92)	-0.2587 (-3.46)**	-0.19262 (-1.71)
IDR	F-statistics 31.57	5.05	
Hausman Test	0.0000**	0.0004**	0.6940

Note:

1. Figures in parentheses for FEM (Fixed Effect Model) are t-statistic and REM (Random Effect Model) are z statistics
2. ***, **, * denotes significant at 1%,5% and 10% confidence level respectively

DVOL has a significant and negative relationship with LIQA and DFR in the fixed effects model. This negative relationship indicates that higher volatility of deposit will lower the ability of Islamic banks to absorb liquidity shock.

The result also indicates that higher deposit volatility suggests instability in deposit and this is related to the uncertainty in the ability to service customer withdrawals. Of course, this situation attracts liquidity risks exposure. However, the coefficient between DVOL and LIQA is small. The intuition behind this condition is that the volume of deposit withdrawals is known and also not random, which mean that withdrawal risk is predictable and Islamic bank's is more prepare to face such liquidity risk (Diamond and Dybvig, 2000). Therefore, this will prevent bank runs and liquidity risk because this situation provides a chance for optimal risk sharing by converting illiquid assets into liquid liabilities for the Islamic banks. For DFR, it has negative and significant relationship with DVOL in the random effects model as shown in Table 4. This result provides evidence that the volatility of deposits will cause some deposit runs for the Islamic banks even though the coefficient is small. According to How et al. (2005), a higher deposit volatility or DVOL suggests deposits instability and is related to the uncertainty in the ability to service customer withdrawals because the lower the value of this ratio, the higher the deposit runs of the banks.

The VOLBBAITAB shows a positive and significant relationship with LIQA in the fixed effects model. If excessive deposit withdrawals can cause liquidity problems, so can the level of the commitments by borrowers and other credit lines. The long-term profitability of the

bank adversely affected if the long-term financing is distorted by the default of the customers. This means that the greater loan volatility, the greater the risk of not being able to fulfill the unexpected financing demand. Higher uncertainty in financing will reduce the capability of the bank to meet excessive financing demands. From the results of LIQA and VOLBBAITAB, it shows that the Islamic banks still face liquidity risk even when they concentrate on debt financing mode. The explanation is that the predominance of debt-financing mode among the Islamic banks is that it is not easy to transform this type of financing into negotiable financial instruments. On the other hand, as shown in Table 4, there is a positive and significant relationship between DFR and VOLBBAITAB in the random effects model shown in Table 4. Any change in debt financing improves the stability of deposits of Islamic banks or lower the deposit runs. One of the reasons is that Murabahah and BBA is mostly chosen by Islamic bank though it is not be turn into liquid before maturity because customer must obey and pay the financing regularly and this will minimize the probability of default (Salman, 2004). Hence, the problem of liquidity risk could be reduced. This result also indicates the Islamic banks' management has been able to meet current liability or how their current assets have been able to match the amount of the demand deposits as they come due when they utilize debt financing mode as the major source of financing.

The regression highlights SIZE is positively related with LIQA in the fixed effects model. This means that an increase in asset size will increase the ability to absorb liquidity shock. It also implies that on the asset side, it can be done by holding a significant proportion of liquid assets. Cash can be used immediately to meet liquidity needs, while government securities can be used readily as collateral. For LIQD, the relationship with SIZE is negative in the fixed effects model. The size of asset (SIZE) is explained from the aspects of too big to fail arguments (Chung-Hua et al., 2010). Banks with large assets would benefit from an implicit guarantee and this will decrease their cost of funding and prepare them to face more liquidity risks (Davis, 2008). This mean that on the liability side, banks should ensure enough diversified funding sources to reduce liquidity risk.

LIQD has a negative relationship with IDR in the fixed effects model shown in Table 4. This implies that when Islamic bank deposit rate increases, the liquidity risk reduces. The implication of this result is that most Islamic bank depositors are profit driven investors who are looking for more attractive rates of return. The depositors may possibly switch their deposits to conventional banks due the attractiveness of conventional interest rates compared to the profit-sharing returns offered by the Islamic banks. This indicates some potential liquidity risks to the Islamic banks when there is a change in the conventional banks' interest rates. The findings follow study by Sudin and Norafifah (2000) showed that customers who place their deposits with saving and investment account facilities are guided by the profit motive. In other words, Islamic banks consider interest rates before adjusting its deposits returns (Ahmad and Mansor, 2003). Moreover, Choong and Ming-Hua (2006) stressed that customers are free to choose either systems and have the right to switch between systems. In short, though Islamic banks are operating on an interest-free basis, the economic environment of a dual banking system may expose them to the problem of rate of returns risk. The rate of returns of Islamic banks have to follow the market trend, else the Islamic banks will face liquidity problem.

The impact of macroeconomic environments on liquidity risk is shown by relating two important macroeconomic variables, which are economic growth and inflation rate. However, the relationship between economic growth (RGDP) and all three liquidity risk variables is not significant. For INF, the results show that there is a significant and positive relationship

between LIQD and INF. This means that the Islamic banks must take into consideration the impact of inflation rate that could decrease the nominal value of their deposits which lead them to hold more liquid assets to absorb inflation shock. This result is consistent with Moore (2010) who found that liquidity tends to be positively related to the inflation rates and the volatility of liquid asset to deposit ratio.

CONCLUSION

Knowledge of the relationship between debt financing modes and liquidity risks is essential for both policy makers and Islamic banking managers in order to understand the risk behaviour of Islamic banks. Against this background, this study analyses the impact of the debt financing modes in particular, as well as other determinants on liquidity risk of the Islamic banks in Malaysia. The motivation for studying the debt financing modes comes from the inconclusive evidence of the liquidity risk arising from debt financing modes. The magnitude of the effect of these debt financing contracts on the liquidity risks of the Islamic banks has been analysed in this study. For debt financing, Islamic banks still face liquidity risk even when they concentrate on debt financing mode. The explanation regarding on this matter is that is not easy to transform this type of financing into negotiable financial instruments, and therefore lead to liquidity risk (Salman, 2004). As for the other determinants, the level of capital is crucial for the Islamic banks for liquidity risk management. Higher volatility of deposit will lower the ability of Islamic banks to absorb liquidity shock and causes some deposit run. The asset size also play a crucial role for liquidity risk management from the aspect of 'too big to fail' argument. The Islamic deposit rate has a negative relationship with liquidity risk; this result also implies that most Islamic bank depositors are profit driven investors who are looking for more attractive rates of return. Finally, Inflation rate has a positive impact to the Islamic Banks liquidity risk and implies that the Islamic banks take into consideration the impact of inflation rate that could decrease the nominal value of their deposits which lead them to hold more liquid assets to absorb inflation shock.

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