Global Business and Management Research: An International Journal
Vol. 13, No. 4 (2021)

Will the Sharia Regulatory Framework and Moral Hazard of Too-Big-to-Fail Stir Liquidity Risk? Evidence from Major Players of Islamic Banks

Nur Hazimah Amran, Wahida Ahmad*
Faculty of Business and Management, Universiti Teknologi MARA, Malaysia
Arshad Ayub Graduate Business School, Universiti Teknologi MARA, Malaysia

Email Address: nurhazimah.amran@gmail.com, wahida@uitm.edu.my

**Corresponding author*

Abstract
This study aims to scrutinize the driving factors that influence liquidity risk of nine major market players of Islamic banks that are, Bahrain, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Turkey, and United Arab Emirates. The study emphasizes overexposure of liquidity risk leads to greater bank fragility. The fragility of bank alarming the whole financial system because of the important of bank as the backbone of a country. The study employs instrumental variable two-stage least squares (IV2SLS) to critically examine the effects of CAMELS+1 on liquidity risk of Islamic banks. The study employs unbalanced panel data that consists of 51 Islamic banks for over the period 1999 to 2015. The study only considers the Islamic banks that have at least three consecutive data in a year to ensure representable of the Islamic banks in that particular year. Interestingly, the study discovers Islamic banks in these major market players are relatively less exposed to moral hazard issue of too-big-to-fail. Further, the Islamic banks that practice stringent Sharia regulatory framework are highly tendency to face lower liquidity risk. Although the study acknowledges the risks in Islamic banks are inevitably still, it can be mitigated.

Keywords: Bank Liquidity, Banking Crisis, Financial Risk, Bailout, Bank Regulation

Introduction

Failure one of the large investment banks in United State, Lehman Brothers during the previous Global Financial Crisis (GFC) 2007-2009 is due to excessive of risk. The excessive of risk may worsen given, existence of other shocks for instance, sudden losses. Prolong losses further increase the bank exposure on risk. Daily banking businesses involve numerous types of risks for example, liquidity risk, credit risk and capital risk. Excessive of risk in banking especially, liquidity risk leads to greater bank fragility. Inability of the banks to meet the demand withdrawal from customers cause to liquidity risk. In this globalization era, the inability of the bank to meet the demand withdrawals from the customers would easily become viral. The spread news deteriorates the banks performance consequently waking the stakeholders. Due to that reason, depositors have high tendency to worry about their savings. As a result, the depositors tend to withdraw their savings. The scenario creates problem to the banks because the banks are highly likely having to accommodate huge amount of withdrawals at once. This leads to imbalance of asset and liability in the banks. Further imbalance of asset and liability create chaos in the banking industry at the same time, alarming the whole banking system. Although risk in banking is inevitable yet it can be mitigated. Therefore, proper risk mitigation is important to ensure the stability of the banks. In response to this problem, the study seeks to

investigate the possible factors in which, capital adequacy (C), asset quality (A), management quality (M), earnings (E) and liquidity (L) influence liquidity risk. Due to Islamic banks are still new to the banking industry as compared to conventional counterparts, the study is interested to focus on liquidity risk in Islamic banks internationally. The study exhibits the cross-countries Islamic banking assets in the following Figure 1. The figure shows the trend of Islamic banking assets (mil USD) for Bahrain, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Turkey and United Arab Emirates for the year 2012 to 2019.

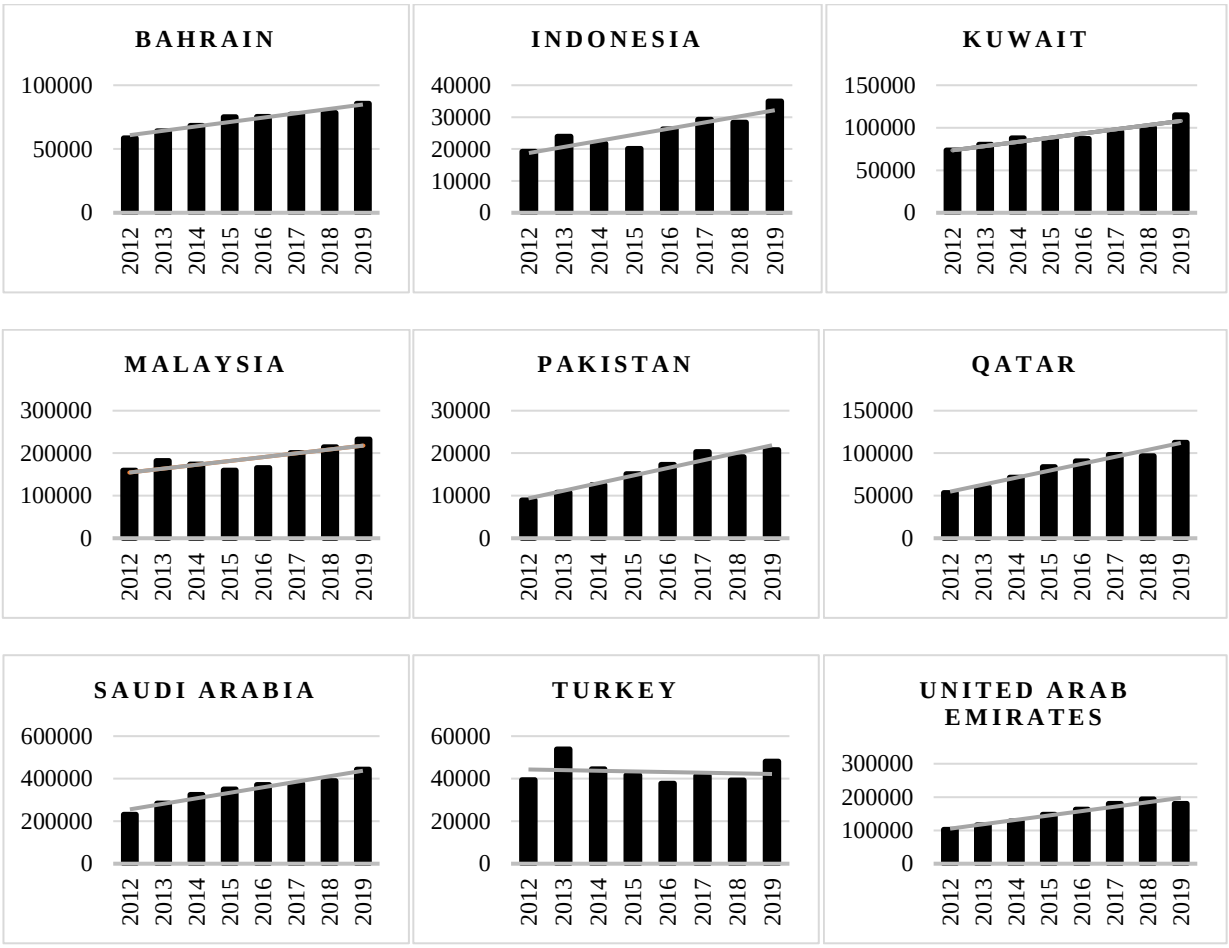

Figure 1: Cross-countries Islamic Banking Assets (mil USD) 2012 to 2019

The study perceives to contribute to the Islamic banking and finance literature, development, stability as well as sustainability of Islamic banks. The study includes additional factors of Sharia compliancy (S) and moral hazard (MH) issue to further analyze on the possible driven factors of liquidity risk in Islamic banks. Henceforth, it is known as CAMELS+1 model.

An Islamic bank carries unique characteristic of business model that is the requirement of Sharia compliant. Unlike the conventional, Islamic banks are exposed to Sharia risk with the possibility of failure to comply with Sharia principles. Due to that reason, the Sharia governance system becomes one of the main concerns of Islamic banks globally. According to Islamic Financial Services Board (2009), Sharia governance is defined as "the set of institutional and organizational arrangements through which Institutions offering Islamic Financial Services (IIFS) ensure there is effective independent oversight of Sharia compliance". Alam et al. (2021) indicate better Sharia governance mechanisms for instance

Sharia Supervisory Board (SSB) formations, compositions and quality improve the Islamic banks performance in Bangladesh. In line with that, Nomran et al. (2018) show SSB characteristics contribute to better performance of Islamic banks in Malaysia. Thus, SSB formations are important to ensure a comprehensive Sharia regulatory framework that oversees the Sharia compliance hence, sustainability of Islamic banks.

The paper structured as follows. The study discusses the controversial issues related to liquidity risk in the following section. Then, the study continues with the discussion of variables and methodology followed by presentation of results estimations. The study ends the discussion with conclusion on liquidity risk of major players of Islamic banks in the next section.

Literature Review

The nature of banking businesses which offer more long-term assets that is, long-term financing while accepting both short-term and long-term deposits from customers. The maturity mismatch contributes to the liquidity risk. Due to that reason, the banks are encouraged to hold buffer of liquidity in order to cushion for sudden withdrawal from the customers (Chen et al., 2018). The concern on bank liquidity is more clear-cut since the onset of previous Global Financial Crisis (GFC) 2007-2009. The crisis significantly impacts those unhealthy banks in which, further deteriorate the banks health to the large extent, cause of bank collapse. Basel Committee on Banking Supervision (2011) proposes better framework that is Basel III, in strengthening the stability of the banks globally. One of the major concerns of Basel III framework is about the minimum liquidity requirement for the banks. The regulatory body introduce two global liquidity standards that are, liquidity coverage ratio (LCR) and net stable funding ratio (NSFR). The liquidity coverage ratio is proxy by high quality liquid assets to net cash outflows while net stable funding ratio is proxy by available stable funding to required amount of stable funding. The former proposes the banks to hold high quality of liquid assets to cover for liquidity issue in short-term meanwhile, the latter proposes the banks to hold stable funding to overcome the liquidity issue in long-term. Both ratios require the banks to maintain at least 100 percent of liquidity coverage ratio and net stable funding ratio at all times respectively. Following the Basel III requirement, Islamic Financial Services Board (2015) also publishes guideline on liquidity management for Islamic banks to ensure the sustainability of Islamic banking development. In this study context, the study intends to prove the capital adequacy (C), asset quality (A), management quality (M), earnings (E), liquidity (L), Sharia compliancy (S) and moral hazard (MH) henceforth, CAMELS+1 model influence on liquidity risk of Islamic banks internationally. The study discusses on the controversial elements of CAMELS+1 model influence liquidity risk in the following paragraph.

Umar et al. (2018) discover positive relationship between capital and liquidity risk of public listed banks in Brazil, Russia, India, China, and South Africa (BRICS) countries. The authors indicate increase capital level lessen the liquidity of banks thus, greater liquidity risk. The relationship is aligned to financial fragility crowding out theory (Diamond & Rajan, 2000, 2001; Gorton & Winton, 2000). The theory postulates higher capital level in the banks lead to less fragile capital structure thereby, less urgency for the banks to raise more liquidity. This impedes the liquidity of banks consequently exposed to greater liquidity risk. On contrary, Huang et al. (2018) find negative relationship between capital and liquidity risk of listed banks in United States. The authors explain greater capital encourages the banks to tolerate the liquidity risk. This demonstrates the banks are correspond to the risk absorption theory (Berger & Bouwman, 2009; Bhattacharya & Thakor, 1993). The theory proposes greater capital enhance the ability of the banks to cushion for the losses incurred in meeting the demand withdrawal from the customers.

In the sense of asset quality, Toh (2019) highlights positive relationship between asset quality and liquidity risk of commercial banks in Malaysia. The author explains commercial banks that have lower asset quality in which, greater credit risk tends to increase their liquidity so as to cover for the possible demand withdrawal from the customers. Due to that reason, the commercial banks in Malaysia are exposed to lower liquidity risk. Similarly, Amin et al. (2018) point out banks that have greater credit risk have less appetite to involve in risky financing thus, lower liquidity risk. In another different study, Abdul-Rahman et al. (2018) document that increase in credit risk of Islamic bank in Malaysia leads to greater liquidity risk. This is due to the banks are unable to provide stable funding to cover for the demand withdrawals from the customers because of the greater non-performing financing thus, implies lower asset quality of Islamic banks in Malaysia.

As for the management quality, Amin et al. (2018) find good management quality which proxy by cost efficiency contributes to greater liquidity risk of Islamic banks in Organization of Islamic Countries (OIC). The authors further indicate the positive relationship show that Islamic banks are highly likely to involve in risky activities given, greater cost efficiency portrays good management quality of the banks. This demonstrates the Islamic banks are able to minimize their cost in order to maximize their outputs for instance, volume of financing. In contrast, the top 61 Chinese commercial banks disclose opposite relationship (Hou et al., 2018). The authors depict good management quality of the commercial banks cause to lower liquidity risk. A good management quality represented by a group of managerial expertise encourage more liquidity due to the good managerial expertise in mitigating the liquidity risk. A study by Ab-Rahim (2017) indicates banks with better management quality are good in monitoring their customer repayment activities. This indirectly consequence to low number of defaulters thereby, greater exposure on liquidity risk. This is due to the banks are less urgency to increase their liquidity since less issue on default borrowers.

Meanwhile, earnings positively influence liquidity risk of Islamic banks in selected Organization of Islamic Cooperation (OIC) countries (Hassan et al., 2019). The authors emphasize the Islamic banks are highly involved in risky investment to generate greater earnings. Due to that reason, the Islamic banks are greatly exposed to liquidity risk. However, Umar et al. (2018) discover contradict argument that state negative relationship between earnings and liquidity risk. The authors postulate greater earnings generation induce more liquidity to the banks thus, lessen the liquidity risk.

As for liquidity, it is well understood that increase in liquidity simultaneously lessen the liquidity risk. Berger et al. (2019) reveal Islamic banks face lower liquidity risk relative to conventional counterparts. The lower liquidity risk exposure improve the stability of Islamic banks. Megeid (2017) uncovers conflicting relationship that articulates conventional banks in Egypt are better in managing liquidity risk as compared to Islamic banks. The author reason out that conventional banks in Egypt hold more cash relative to Islamic banks. The author further indicate the Islamic banks have limited liquidity sources as they operate based on Sharia principles that prohibit interest-based transactions, gharar and maysir.

In addition, the practice of Islamic banks which comply to Sharia principles in their banking businesses and activities distinguish themselves relative to conventional counterparts. Islamic Financial Services Board (2009) proposes comprehensive guidelines on Sharia governance system for Islamic banks that brings into the introduction of Sharia Supervisory Board (SSB) so as to ensure the stability and continuity of global Islamic banks. Mohammed and Muhammed (2017) list two level of Sharia Supervisory Board (SSB) that are, macro level (centralized) and micro level (decentralized). The decision on Sharia compliancy products and operations for the former level are made by the central bank meanwhile, the latter is made by individual banks. Hassan et al. (2019) hypothesize existence of Sharia Supervisory Board

(SSB) facilitates the Islamic banks to oversight the banking operations and activities compliance to the Sharia principles. The supervisory practices encourage the improvement of liquidity risk management in Islamic banks. This adds to the stringency of Islamic banks regulatory framework does influence risk taking decision of Islamic banks in Gulf Cooperation Council (GCC). The authors find large size of Sharia Supervisory Board (SSB) encourages the risk-taking activities of the Islamic banks. Noordin and Kassim (2019) disclose good composition of Sharia committee enhance the effectiveness of monitoring system in ensuring Sharia compliant banking businesses and transactions. In other study, Rashid et al. (2018) emphasize the important of regulatory framework harmonization towards stability of global Islamic banks. The weakness of corporate governance put the Islamic bank management system at risk.

Despite the aforementioned explanatory variables, the study includes additional possible factor of moral hazard issue of too-big-to-fail in order to further investigate the influence of that explanatory variable on Islamic banks liquidity risk. Toh (2019) discovers positive relationship between size and liquidity risk of Malaysian commercial banks. The author depicts large commercial banks are exposed to greater liquidity risk. This is due to the large commercial banks are reluctant to hold ample of liquidity as they find themselves as too-big-to-fail. Therefore, they are confident that the regulator would not let them collapse in the case of financial distress. Similarly, Amran and Ahmad (2017) and Mahmood et al. (2018) discover too-big-to-fail Islamic banks are exposed to greater liquidity risk. The former study finds ASEAN Islamic banks face greater liquidity risk due to large banks deal with great financing businesses. Failure to collect the repayment leads to liquidity distress. The later study emphasizes that large full-fledged Islamic banks also face greater liquidity risk. This is due to large full-fledged are Islamic banks extensively involved in risky financing in generating more earnings to the banks. In contrast, Alzoubi (2017) shows negative relationship between size and liquidity risk of Islamic banks. The author points out large Islamic banks tend to stabilize themselves through risk mitigation. The rationale of this decision is to retain the trust and confidence of their existing and potential customers.

The study includes two control variables despite of the aforementioned explanatory variables. The inclusion of the control variables that are, economic growth and financial crisis are to control for the time and variation of countries respectively. Referring to the first control variable that is economic growth, Al-Harbi (2017) unveils positive relationship between country economic growth and liquidity risk of Organization of Islamic Cooperation (OIC) countries. The author highlights during booming of economy, the customers tend to spend more as they have better purchasing power in addition to large volume of consumptions. Due to that reason, there are tendency of the banks to face greater liquidity risk to meet the demand withdrawal from the customers. Oppositely, Chaabouni et al. (2018) criticize economic growth of a country is negatively related to the banks liquidity risk in United Kingdom and French banking sector. The authors further explicate during the booming of economy, the banks have greater liquidity level. This possibly due to the banks are well prepared with buffer of liquidity as they are expecting greater demand of withdrawals from the customers. In other study, Ahmad and Amran (2019) conclude Islamic banks in Malaysia are efficient in giving out financing during the booming of economy. Due to that reason, the scenarios urge the banks to allocate more liquidity buffer thereby, lessen the liquidity risk.

According to Hassan et al. (2019) Islamic banks in the Organization of Islamic Cooperation (OIC) countries face the greater liquidity risk during the financial crisis. One of the reasons that lead to the greater liquidity risk during financial crisis is limited access to Sharia compliant liquid assets (Ghenimi et al., 2020). In a similar vein, Mahdi and Abbes (2018) find both conventional and Islamic banks in the Middle East and North Africa (MENA) are exposed to

greater liquidity risk during the financial crisis. The following section discusses on the research methodology.

Methodology

This study uses secondary data which obtained from Bankscope database. The study includes nine countries, which are the major market players of Islamic banks according to their international total assets participation (Ernst & Young, 2016). The countries include Bahrain, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Turkey, and United Arab Emirates. The study covers for 17 years of unbalanced panel data that spans from 1999 to 2015. The study considers the most data availability and efficiency of the data inclusion in deciding the range of the study period. The study excludes observations that has less than three Islamic banks data in a year to ensure the minimum observation for the study is representable for the particular year. Due to limitation on the data availability, it leads to shrinking of the number of observations hence, the study consists of 351 number of observations from 51 Islamic banks. The study includes capital adequacy, asset quality, management quality, earnings, liquidity, Sharia compliancy and moral hazard henceforth, CAMELS+1 in investigating the possible driven factors of Islamic banks liquidity risk. Table 1 exhibits the list of variables and their respective proxy measurement.

Table 1: Variables Definition and Proxies

	Symbol	**Proxy Measurement**
Dependent Variable		
Liquidity risk	LR	Net financing to total assets (%)
Independent Variables		
Capital adequacy	CAD	Equity to net financing (%)
Asset quality	AQ	Financing loss provision to net operating revenue (%)
Management quality	MQ	Other operating income to average total assets (%)
Earnings	EARN	Net income to average total assets (%)
Liquidity	LIQ	Liquid assets to total deposits and short-term funding (%)
Sharia compliancy	SC	0 = country with less stringent Sharia regulatory framework 1 = country with stringent Sharia regulatory framework
Moral hazard	MH	0 = small bank less likely to face moral hazard issue 1 = large bank with high potential of moral hazard
Control Variables		
Economy	ECO	Gross Domestic Product (GDP) growth rate (%)
Financial crisis	FC	0 = normal economic condition 1 = financial crisis
Instrumental Variable		
Liquidity	LIQIns	Net financing to total deposits and short-term funding (%)

In this study context, the study assesses the stringency of Sharia regulatory framework based on four criteria that are, (i) the existence of Sharia framework, (ii) the presence of Islamic banking law, (iii) the restriction of Sharia Supervisory Board members and (iii) the composition of Sharia Supervisory Board of a country or bank. The study postulates different country would have different guidelines of framework. The country that does not meet all the criteria is identified as the country with less stringent Sharia regulatory framework and vice-versa. As for the moral hazard issue of too-big-to-fail, the study finds that identification of large bank of a country varies for different year according to their asset's values. The study assesses the total assets of Islamic banks for each year and country individually. This is due to the study

acknowledge that large bank in a country could be a small bank in other country. The study classifies the total asset of Islamic banks into four quartiles. The Islamic banks that belong to the fourth (4^{th}) quartile are identified as large banks with possibility of moral hazard issue of too-big-to-fail. However, the study identifies Islamic banks that belong to the third (3^{rd}) quartile as large banks in the case of absence Islamic banks that belong to the fourth (4^{th}) quartile. Thus, large Islamic banks with possibility of moral hazard issue of too-big-to-fail is denoted as 1 while 0 otherwise. Notably, the study identifies 2007 to 2009 as financial crisis period and denotes as 1 while 0 otherwise.

The study adapts multiple regression of instrumental variable two-stage least squares (IV2SLS) method to analyze the objectives. The study is unable to use Ordinary Least Squares (OLS) method to overcome the endogeneity issue. Thus, the study proceeds the analysis of cross-countries liquidity risk by embarking into diagnostic tests of instrumental variable two-stage least squares that are, endogeneity test, identification test, over identification test and strength of the instrument test. Pursuing the investigation, the study employs regression analysis using Stata statistical package to further analyze on the liquidity risk of cross-countries Islamic banks. The study formulates the following general equation (1) and (2) of instrumental variable regression model as follow:

$$Y_{it} = \beta_0 + \beta_1 X_{1_{it}} + \beta_n X_{n_{it}} \ldots + \beta_z Z_{it} + e_{it} \quad (1)$$

$$Z_{it} = \beta_{0_z} + \beta_{1_z} V_{1_{it}} + \pi_{it} \quad (2)$$

where,

Y	= Dependent variable
β_0, β_{0_z}	= Constant value
β_1, β_n	= Regression coefficient of exogenous variable $(1, 2..n)$
β_z	= Regression coefficient of endogenous variable
β_{1_z}	= Regression coefficient of instrumental variable
X_1, X_n	= Exogenous variable $(1, 2..n)$
Z	= Endogenous variable
V_1	= Instrumental variable
i	= Unit of analysis $(1, 2..i)$
t	= Time $(1, 2..t)$
e, π	= Error term

The study applies the following econometric equation (3) and (4) in assessing the possible driven factors of Islamic bank liquidity risk.

$$LR_{it} = \delta_0 + \delta_1 CAD_{it} + \delta_2 AQ_{it} + \delta_3 MQ_{it} + \delta_4 EARN_{it} + \delta_z LIQ_{it} + \delta_6 SC_{it} + \delta_7 MH_{it} + \delta_8 ECO_{it} + \delta_9 FC_{it} + \theta_{it} \quad (3)$$

$$LIQ_{it} = \delta_{0_z} + \delta_{1_z} LIQIns_{it} + \alpha_{it} \quad (4)$$

Results and discussion

The study embarks with a list of diagnostic tests for instrumental variable two-stage least squares (IV2SLS) as exhibited in Table 2. In the sense of endogeneity test, the study finds both Wu-Hausman and Durbin-Wu-Hausman chi-sq test are significant at one percent level for all estimators. This indicates liquidity is correlative to the error term of the regression. As for the

under-identification test, the study reveals Anderson canonical correlations LM statistic are statistically significant for each model. The result shows instrument used in this model is valid instrument.

Sargan statistic reports for over identification test. The result indicates all models are exactly identified in which, the number of instrumental variable (m) is equal to the number of endogenous variable (k). Thus, the study does not need to further examine on over identifying restrictions. Despite the diagnostic tests, the study also examines weak identification of the instrument based on Cragg-Donald Wald F-statistic and Stock-Yogo. Due to the study has only one endogenous variable, the Cragg-Donald Wald F-statistic is identical to first stage F-statistic regression. Additionally, the study finds the instrumental variable is statistically unrelated to the other variables as the Cragg-Donald Wald F-statistic is greater than ten. The study also discovers the Cragg-Donald Wald F-statistic is greater than Stock-Yogo critical value in all models. The result shows the instrumental variable used in all models are strong instrument.

In order to further investigate the possible driven factors that influence liquidity risk of Islamic banks, the study proceeds the investigation with instrumental variable two-stage least squares (IV2SLS). Table 3 represents the estimation for liquidity risk of Islamic banks. The estimations reveal immaterialize different findings between the panels thus, indicate robustness of the models. Therefore, the study reports Panel 4 that consist of all elements which is, CAMELS+1 with two control variables. The findings disclose capital adequacy, management quality, liquidity, Sharia compliancy, economy and financial crisis are statistically significant to the liquidity risk of Islamic banks. Meanwhile, the study discovers less detrimental effects of asset quality, earnings and moral hazard on Islamic banks liquidity risk.

Table 2: Diagnostic Tests for Instrumental Variable Two-stage Least Squares (IV2SLS)

Endogeneity test:				
Wu-Hausman	587.806***	581.329***	582.244***	580.942***
Durbin-Wu-Hausman	221.657***	221.230***	221.358***	221.415***
Under identification test:				
Anderson canon. corr. LM statistic	29.607***	33.265***	34.063***	32.680***
Over identification test of all instruments:				
Sargan statistic	0.000	0.000	0.000	0.000
Weak identification test:				
Cragg-Donald Wald F statistic	31.689	35.805	36.757	35.009
Stock-Yogo weak ID test critical values:				
10% maximal IV size	16.380	16.380	16.380	16.380
15% maximal IV size	8.960	8.960	8.960	8.960
20% maximal IV size	6.660	6.660	6.660	6.660
25% maximal IV size	5.530	5.530	5.530	5.530
Source: Stock-Yogo (2005).				

Notes: *** is significant at 1% level, ** is significant at 5% level and * is significant at 10% level.

Table 3: Instrumental Variable Two-stage Least Squares (IV2SLS) Regression

	Panel 1	**Panel 2**	**Panel 3**	**Panel 4**
Capital adequacy	0.829**	0.589**	0.588**	-2.650***
Asset quality	0.192**	0.153*	0.117	0.129
Management quality	-1.792	-3.082*	-3.597**	-3.958**
Earnings	3.001**	2.189	2.554*	1.735
Liquidity	-2.718***	-2.606***	-2.584***	-2.605***
Sharia compliancy		-11.755***	-10.620***	-12.498***
Moral hazard		-1.682	-2.093	-1.389
Economy	0.230	0.522		0.852*
Crisis			7.026*	9.982**
_cons	110.108***	121.829***	123.050***	122.521***
obs.	351	351	351	351

Notes: *** is significant at 1% level, ** is significant at 5% level and * is significant at 10% level.

Management quality is negatively and statistically significant towards Islamic banks liquidity risk. The study emphasizes that Islamic banks rely heavily on other operating income in generating earnings. Thus, the increment of other operating income suggest the Islamic banks have good management quality in turn, lower liquidity risk. The findings is supported by Hou et al. (2018).

Capital adequacy shows negative and statistically significant relationship towards Islamic banks liquidity risk at one percent level. This indicates the Islamic banks hold buffer of capital greater than the requirement to cushion for sudden withdrawal from the customers. Due to that reason, the Islamic banks are exposed to lower liquidity risk. The findings are in line to the theory of risk absorption that postulates banks hold more capital in order to buffer the losses that induced by meeting the withdrawals demand from the customers (Berger & Bouwman, 2009; Bhattacharya & Thakor, 1993; Huang et al., 2018).

The study uncovers asset quality is negatively related to the Islamic banks' liquidity risk however, the findings show less detrimental effects because of insignificant relationship. The study suggests lower provisions for financing losses signals for greater asset quality thereby, less liquidity risk exposure of Islamic banks. Due to less provision allocated, the Islamic banks are more prudent in mitigating the liquidity risk.

Following Hassan et al. (2019), the study discloses positive relationship between earnings and liquidity risk of Islamic banks nevertheless, the study is unable to prove the significant relationship between the two. The study indicates greater earnings promotes greater liquidity risk to the Islamic banks. The Islamic banks tend to engage more in investment of illiquid assets indeed, risky financing to generate more earnings. Due to that reason, the Islamic banks are widely exposed to the liquidity risk.

The study reveals negative and significant relationship between liquidity and liquidity risk of Islamic banks. The study explains liquid Islamic banks are less likely to face liquidity problem in fulfilling demand withdrawal from the customers. Although there is always tendency that Islamic banks record losses in financing activities, yet the banks are still able to overcome the issue given buffer of liquidity hold by the banks. Therefore, the Islamic banks apparently able to offset the losses with the ample of liquidity reserves.

In the sense of Sharia compliancy, the study points out that country with stringent regulatory framework is exposed to lower liquidity risk. The results indicate there are significant different of liquidity risk between the countries that have stringent Sharia regulatory framework as compared to the countries that have less stringent Sharia regulatory framework. Further, the

finding suggests complying with the Sharia principles lead to less exposure of Islamic banks liquidity risk. The findings show contradict arguments to Hassan et al. (2019) that posit stringent Sharia regulatory framework tends to face greater risk.

In the sense of moral hazard issue, too-big-to-fail the study finds small Islamic banks that are less likely engaged into moral hazard issue have greater liquidity risk as compared to large Islamic banks with the possibility of moral hazard issue, too-big-to-fail. Yet, the study is unable to prove the significant different of liquidity risk between the Islamic banks that have the possibility of moral hazard issue, too-big-to-fail and the otherwise. Therefore, the study concludes that Islamic banks relatively are not exposed to moral hazard issue.

The study finds economic growth is positively related to Islamic banks liquidity risk. The study highlights Islamic banks tend to face greater liquidity risk during booming of economy. This is due to Islamic banks hold less liquidity buffer during the booming. Further, the customers have better purchasing power during the booming of economy therefore, they tend to invest and spend more during that time. According to Ahmad and Amran (2019), the customers demand more financing during greater economic growth. Due to greater purchasing power, the Islamic banks are highly likely unable to accommodate the withdrawals demand from the customers thus, overexposure of liquidity risk.

The study demonstrates there is statistically significant different of liquidity risk during financial crisis and normal period. During the financial crisis, the study exhibits Islamic banks face greater liquidity risk as compared to the normal period. The study stresses out, the customers tend to withdraw their money aggressively during the financial crisis. This is due to the customers are in the need of money and discomfort feeling among the depositors that afraid the banks would collapse in downturn of economy. Thus, the depositors would aggressively withdraw their money hence lead to overexposure of Islamic banks liquidity risk (Hassan et al., 2019). The study concludes the discussion and provides recommendations for future research in the following section.

Conclusion

To tighten up, the study identifies capital adequacy, management quality, liquidity, Sharia compliancy, economy and financial crisis are among the significant drivers that influence liquidity risk of Islamic banks. Therefore, the Islamic banks have to give extra concern in mitigating the liquidity risk of Islamic banks. The Islamic banks are proposed to maintain buffer of capital in which, greater than the required level, greater asset quality, better management quality, higher liquidity, and practice stringent Sharia regulatory framework. In addition to that, the Islamic banks are also proposed to strictly monitor the liquidity of Islamic banks during the booming of economy and during the financial crisis period. The stringency of Sharia regulatory framework empirically affects liquidity risk of Islamic banks. Hence, it is advisable for Islamic banks to improve their regulatory framework to better mitigating the liquidity risk.

The study urges the future research to further scrutinize the driven factors of liquidity risk in Islamic banks by employing longer period of study. The study also proposes the future research to examine other financial risks in Islamic banks that could better differentiate risks management in Islamic banks and the conventional counterparts. Acknowledging risks in banking are inevitable yet, it can be mitigated.

This study encounters into several limitation among others is the data limitation on Islamic banks. Due to the Islamic banks are in growing stage, the availability of their data is still left behind relative to the conventional counterparts. However, the number of Islamic banks is expected to grow rapidly given the demand from other countries. Other than that, the classification of Islamic banks is purely based on the Bankscope database classification.

References

Ab-Rahim, R. (2017). Efficiency and Competition in the Malaysian Banking Market: Foreign versus Domestic Banks. *Gadjah Mada International Journal of Business; Vol 19, No 2 (2017): May-AugustDO - 10.22146/gamaijb.6106*. https://jurnal.ugm.ac.id/gamaijb/article/view/6106

Abdul-Rahman, A., Sulaiman, A. A., & Mohd Said, N. L. H. (2018). Does financing structure affects bank liquidity risk? *Pacific-Basin Finance Journal*, *52*, 26-39. https://doi.org/10.1016/j.pacfin.2017.04.004

Ahmad, W., & Amran, N. H. (2019). Financing Activities: Peril or Prosperity? *Malaysian Journal of Consumer and Family Economics (MAJCAFE)*, *22*(S1), 128-143. http://www.majcafe.com/wp-content/uploads/2019/10/2019-Vol-22-S1-Article-8.pdf

Al-Harbi, A. (2017). Determinants of banks liquidity: evidence from OIC countries. *Journal of Economic and Administrative Sciences*, *33*(2), 164-177. https://doi.org/10.1108/jeas-02-2017-0004

Alam, M. K., Rahman, M. M., Runy, M. K., Adedeji, B. S., & Hassan, M. F. (2021). The influences of Shariah governance mechanisms on Islamic banks performance and Shariah compliance quality. Asian Journal of Accounting Research, ahead-of-print(ahead-of-print). https://doi.org/10.1108/AJAR-11-2020-0112

Alzoubi, T. (2017). Determinants of liquidity risk in Islamic banks [Article]. *Banks and Bank Systems*, *12*(3), 142-148. https://doi.org/10.21511/bbs.12(3).2017.10

Amin, S. I. M., Ali, M. H., & Nor, S. M. (2018). Cost efficiency and liquidity risk in banking: New evidence from OIC countries [Article]. *International Journal of Business and Management Science*, *8*(2), 255-276. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85063320144&partnerID=40&md5=e9d34c25642dba6303d87fac694325c5

Amran, N. H., & Ahmad, W. (2017). Liquidity Risk: An Islamic Banking Perspective. *Jurnal Intelek*, *12*(1). http://jurnalintelek.uitm.edu.my/index.php/main/article/view/148/140

Basel Committee on Banking Supervision. (2011). *Basel III-A Global Regulatory Framework for more Resilient Banks and Banking Systems*.

Berger, A. N., Boubakri, N., Guedhami, O., & Li, X. (2019). Liquidity Creation Performance and Financial Stability Consequences of Islamic Banking: Evidence from a Multinational Study. *Journal of Financial Stability*, 100692. https://doi.org/10.1016/j.jfs.2019.100692

Berger, A. N., & Bouwman, C. H. S. (2009). Bank liquidity creation. *Review of Financial Studies*, *22*(9), 3779-3837.

Bhattacharya, S., & Thakor, A. V. (1993). Contemporary Banking Theory. *Journal of Financial Intermediation*, *3*(1), 2-50. https://doi.org/10.1006/jfin.1993.1001

Chaabouni, M. M., Zouaoui, H., & Ellouz, N. Z. (2018). Bank capital and liquidity creation: new evidence from a quantile regression approach. *Managerial Finance*, *44*(12), 1382-1400. https://doi.org/10.1108/mf-11-2017-0478

Chen, N., Huang, H.-H., & Lin, C.-H. (2018). Equator principles and bank liquidity. *International Review of Economics & Finance*, *55*, 185-202. https://doi.org/10.1016/j.iref.2017.07.020

Diamond, D. W., & Rajan, R. G. (2000). A Theory of Bank Capital. *The Journal of Finance*, *55*(6), 2431-2465. https://doi.org/10.1111/0022-1082.00296

Diamond, D. W., & Rajan, R. G. (2001). Liquidity Risk, Liquidity Creation, and Financial Fragility: A Theory of Banking. *Journal of Political Economy*, *109*(2), 287-327.

Ernst, & Young. (2016). *World Islamic Competitiveness Report 2016*. E. Limited. http://www.ey.com/

Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2020). Liquidity risk determinants: Islamic vs conventional banks. International Journal of Law and Management, 63(1), 65-95. https://doi.org/10.1108/ijlma-03-2018-0060

Gorton, G., & Winton, A. (2000). *Liquidity provision, bank capital, and the macroeconomy* [Working Paper]. University of Minnesota.

Hassan, M. K., Khan, A., & Paltrinieri, A. (2019). Liquidity risk, credit risk and stability in Islamic and conventional banks. *Research in International Business and Finance*, *48*, 17-31. https://doi.org/10.1016/j.ribaf.2018.10.006

Hou, X., Li, S., Li, W., & Wang, Q. (2018). Bank diversification and liquidity creation: Panel Granger-causality evidence from China. *Economic Modelling*, *71*, 87-98. https://doi.org/10.1016/j.econmod.2017.12.004

Huang, S.-C., Chen, W.-D., & Chen, Y. (2018). Bank liquidity creation and CEO optimism. *Journal of Financial Intermediation*, *36*, 101-117. https://doi.org/10.1016/j.jfi.2018.03.004

Islamic Financial Services Board. (2009). *Standard 10: Guiding principles on Corporate Governance for Institutions offering Islamic Financial Services*.

Islamic Financial Services Board. (2015). Guidance Note on Quantitative Measures for Liquidity Risk Management in Institutions Offering Islamic Financial Services [Excluding Islamic Insurance (Takāful) Institutions and Islamic Collective Investment Schemes] [Guidance Note]. 60. http://www.ifsb.org/

Mahdi, I. B. S., & Abbes, M. B. (2018). Relationship between capital, risk and liquidity: a comparative study between Islamic and conventional banks in MENA region. Research in International Business and Finance, 45, 588-596. https://doi.org/10.1016/j.ribaf.2017.07.113

Mahmood, H., Gan, C., & Nguyen, C. (2018). Maturity transformation risk factors in Islamic banking: Implication of Basel III liquidity regulations. *Managerial Finance*, *44*(6), 787-808. https://doi.org/10.1108/MF-07-2017-0259

Megeid, N. S. A. (2017). Liquidity risk management: conventional versus Islamic banking system in Egypt. *Journal of Islamic Accounting and Business Research*, *8*(1), 100-128. https://doi.org/10.1108/jiabr-05-2014-0018

Mohammed, S. A. S. A.-N., & Muhammed, J. (2017). The relationship between agency theory, stakeholder theory and Shariah supervisory board in Islamic banking. *Humanomics*, *33*(1), 75-83. https://doi.org/10.1108/H-08-2016-0062

Nomran, N. M., Haron, R., & Hassan, R. (2018). Shari'ah supervisory board characteristics effects on Islamic banks' performance. International Journal of Bank Marketing, 36(2), 290-304. https://doi.org/10.1108/IJBM-12-2016-0197

Noordin, N. H., & Kassim, S. (2019). Does Shariah committee composition influence Shariah governance disclosure? *Journal of Islamic Accounting and Business Research*, *10*(2), 158-184. https://doi.org/10.1108/JIABR-04-2016-0047

Rashid, U. S. A., Rahman, A. A., & Markom, R. (2018). The Regulatory Framework on Liquidity Risk Management of Islamic Banking in Malaysia. *International Journal of Business and Society, 19*(3), 332-352.

Toh, M. Y. (2019). Effects of bank capital on liquidity creation and business diversification: Evidence from Malaysia. *Journal of Asian Economics*, *61*, 1-19. https://doi.org/https://doi.org/10.1016/j.asieco.2018.12.001

Umar, M., Sun, G., Shahzad, K., & Rao, Z.-u.-R. (2018). Bank regulatory capital and liquidity creation: evidence from BRICS countries. *International Journal of Emerging Markets*, *13*(1), 218-230. https://doi.org/10.1108/IJoEM-04-2015-0072