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DOES FINANCING STRUCTURE AFFECTS BANK LIQUIDITY RISK?

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ABSTRACT

This paper investigates whether FS affects bank liquidity risk. Using the Malaysian banking data sets, we compare the FS-liquidity risk relationships between the Islamic and conventional banking institutions. FSs are measured by real estate financing, financing concentration, short-term FS stability, and finally medium-term FS stability. Meanwhile, for liquidity risk measures, we adopt the BASEL III approach such as liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) in quantifying short- and long-term liquidity risk, respectively. The unbalanced static panel regressions of 27 conventional and 17 Islamic banks from 1994 to 2014 were analyzed to evaluate the relationships. Our results illustrate that increasing number of real estate financing and short-term FS stability of the Islamic banks may increase both their short- and long-term liquidity risks. On the other hand, even though real estate financing does not affect liquidity risks of the conventional banks, increasing short-term FS stability and financing specialization may increase their long-term liquidity risk. As the liquidity risk behavior, to some extent, differs between the two banking systems, we recommend the regulatory bodies and market players to develop a separate liquidity risk management framework for conventional and Islamic banking institutions.

Keywords: *Liquidity risk; Financing Structure; Banks*
JEL classification: *G28, G21, G32*

1. Introduction

Malaysia has been known as a model of Islamic finance due to the regulated and rapid expansion of the Islamic banking industry in the country (Rudnyckyj, 2014). The Malaysian Islamic banking industry has been established since 1983 via the formation of the first Islamic bank in Malaysia, Bank Islam Malaysia Berhad (BIMB). Ten years later, conventional banks in Malaysia are allowed to have Islamic windows that allow these banks to offer Islamic banking products. Since then, all Islamic banks (be it full-fledge or windows or subsidiaries) are formally governed by the Islamic Banking Act 1983 (IBA) and informally controlled by the Banking and Financial Institutions Act 1989 (BAFIA) since IBA only covers the procedural while the operational part of an Islamic banks is still subjects to BAFIA. Nevertheless, both acts were completely overruled by the Islamic Financial Services Act (IFSA 2013) and Financial Services Act (FSA 2013), respectively to improve the Malaysian governing laws.

Islamic banking in Malaysia has expanded rapidly and became one of the major financial intermediaries. Similar to conventional banking, via financing tools, Islamic banking also functions as a conduit for monetary policy (Mohamad, Borhan, & Sulaiman, 2012). In addition, Islamic banks can generate profit as long as they operate in a *shariah*-compliant manner (Shuib, Borhan & Abu Bakar, 2011). Islamic banks differ from conventional banks mainly because of the prohibition of usury (*riba'*) in its operating system. *Riba'* is prohibited in Islam due to the oppressive features of the contracting parties and injustice in dealings that are claimed to be existed in conventional banking system. In contrast to conventional banks, profit rate charged on financing (be it fixed or floating) by the Islamic banks must have a counter value in the context of risk-taking element (Man Kit & Abdul-Rahman, 2011). Furthermore, Hadenan & Borhan (2006) and Rosland & Borhan (2013) highlighted the role of Islamic banks should not only be limited to offering financing via a borrower-lender relationship, but also through a partnership affiliation (either as investors in the asset-side or entrepreneurs in the liability-side of the bank's balance sheet). In the vein of the conventional banks, the main source of income of Islamic banks relies on the spread between returns from the financing offered and expenses owed to the depositors and investors. In this setting, the financing offered is usually long-term in nature and subject to credit risk and default risk.

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The 2008 global financial crisis has led to the instability in the financial system. Many countries around the world are affected during the crisis. Since then, the experience of banks in several developed countries, which are facing liquidity pressures due to the financial market turmoil, has revealed the importance of liquidity risk to be managed effectively. For instance, there was a bank run in Greece (The American Interest, 2015). Liquidity risk could perhaps be much more important than other types of risks (Adalsteinsson, 2014) as it can collapse the whole financial system in the country when bank panic occurs. Failure to meet deposits withdrawals, either due to the incapability to quickly sell liquid asset or to purchase bank liability, at the time of need may tarnish the credibility of the bank in managing its liquidity risk. Moreover, limited shariah-compliant money market instruments and shallow money market participants have aggravated the challenges for the Islamic banks in managing their liquidity risk exposure efficiently.

The ideal benchmark to assess the bank's competency to fulfill its commitments to the depositors at a minimal cost is via liquidity position. One of the most crucial risks to be managed constantly and effectively is the liquidity risk (Khan & Ahmed, 2001). Iqbal (2012) mentioned that the management of liquidity risk is vital in shaping the direction of the banking institutions, regardless whether the banks are conventional or Islamic. Failure to have a systematic liquidity management may trigger insolvency risk or "bank run", especially when it comes to the banks' inability to provide withdrawals to the depositors at the moment it is needed (Saidan & Ismail, 2013). In other words, liquidity risk is an output from the banks' incapability in balancing their assets and liabilities, especially due to the mismatch between deposits collected and financing given (Samsudin, Abd Halim, Mohamad, & Sulaiman, 2012). Using the Basel III liquidity risk measures, Vazquez and Federico (2015) proved that banks with fragile structural liquidity are prone to fail, particularly during crisis.

Previous studies have empirically shown that FS affects various types of bank risk, but none has specifically focused on liquidity risk. While Blasko & Sinkey Jr. (2006) found that lending in real estate sector affects the US banks' ability to manage interest rate risk, Ahmad & Mohamad (2004) showed evidence that lending in risky sector reduces market risk for the Malaysian depository institutions. Moreover, in terms of insolvency and foreign exchange rate risk, Abdul-Rahman (2009) and Abdul-Rahman & Shahimi (2010) found that FS has a significant impact to some degree on those types of risk for both Islamic as well as conventional banks. Against this background, we post our research questions as follows. Firstly, does FS affect liquidity risk? Secondly, is there any difference in the FS-liquidity risk relationship between Islamic and conventional banks? Thirdly, if the liquidity risk behavior and its determinants differ between the two systems, do regulators have to implement a unique liquidity risk management framework for each? By comparing the FS-liquidity risk relationships between the Malaysian conventional and Islamic banks, we hope that our findings will offer vital policy implications for countries where dual banking systems coexist.

Combining the efficiency-liquidity risk hypothesis and FS-risks strand of the literature mentioned above, we aim to investigate whether FS affects liquidity risk. To investigate the FS-liquidity risk hypothesis, firstly, we construct four FS measures based on Abdul-Rahman & Shahimi (2010) such as real estate financing, financing concentration, stability of short-term FS and stability of medium-term FS. Secondly, we calculate two latest liquidity risk measures, introduced by Basel III, namely, liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) to measure short- and long-term liquidity risk, respectively. Finally, we use panel regression analysis to alternately test the relationship between four types of FS measures and two types of liquidity risk measures.

Our analysis shows that real estate financing and stability of short-term FS for Islamic banks are positively related to both liquidity risk measures. This implies that increasing number of real estate financing and a stable short term FS may increase Islamic banks' short- and long-term liquidity risks. Despite real estate financing does not affect conventional banks' liquidity risks, a stable short-term FS and increasing financing concentration can positively influence their long-term liquidity risk. In general, our findings somehow yield different results between Islamic and conventional banks.

In this setting, we hope to contribute to the body of knowledge in at least threefold. Firstly, to the best of our knowledge, this is the first study that empirically analyzes the impact of FS on liquidity risk as previous research either theoretically infers FS-liquidity relationship or empirically shows the influence of FS on different types of risks. Secondly, we compare the FS-liquidity risk relationship for both conventional and Islamic banks simultaneously using two different data sets. The majority of past studies either focus on conventional or Islamic banks separately or examine the impact of FS on various types of systematic risks with a dummy variable to represent Islamic banking in a single data set. Thirdly, we use four different FS measures in analysing two liquidity risk measures, introduced by Basel III. The four FS measurements capture a different aspect of financing composition while the two liquidity risk measurements consider both short- and longer-term liquidity risk exposures. Analysing FS and liquidity risk from a different angle provides a more comprehensive investigation in exploring the FS-liquidity risk hypothesis.

Besides that, our findings suggest some policy implications. As we show evidence that FS, to some extent, affects either short- or longer-term liquidity risk, the magnitude of the relationship does not only vary between different liquidity risk measures, but also it differs between the two banking systems. We hope our findings shed some lights to the regulators and market players of both conventional and Islamic banking systems to distinctly develop an effective strategy in managing the financing portfolio as it plays a role in liquidity risk management framework.

The remainder of this paper is organized as follows. The second section discusses the literature review, followed by the research methodologies. The fourth section describes the findings of the analysis and the last section covers the conclusion, including the policy implications derived.

2. Literature Review

Liquidity risk is defined as the risk of being incapable to either fulfill the commitments of the depositors without experiencing unacceptable costs or to finance rises in assets as required. Typically, liquidity issue arises due to the large deposit withdrawals when banks do not have adequate cash in hand (Iqbal, 2012). In reality, banks face imbalances in the asset and liability side of the balance sheet on a regular basis, thus, they need to manage it properly, or else they may be exposed to insolvency risk.

Basically, liquidity risk can be categorized into two: namely, the market liquidity risk and funding liquidity risk (Ruozi & Ferrari, 2013; Drehmann & Nikolaou, 2013; Iskandar, 2014). While the former denotes the risk that banks are unable to transform their financial asset into cash, the latter refers to the difficulty of banks to meet their liabilities immediately or in a cost-effective manner.

With respect to liquidity risk measures, previous researchers adopted simple accounting measures such as ratio of total deposit to total asset (in Sulaiman, Mohamad & Samsudin, 2013), ratio of cash to total asset (in Akhtar, Ali & Sadaqat, 2011; Anam, Hassan, Ahmed, Uddin & Mahbub, 2012; Abdul karim, 2013; Iqbal, 2012 and Ramzan & Zafar, 2014), ratio of capital to total asset (in Abdullah & Khan, 2012), and ratio of current asset to total liabilities (in Ahmed, Ahmed & Naqvi, 2011) in analyzing the impact of various factors on liquidity risk. Meanwhile, Buch and Goldberq (2015) measured market liquidity risk from the perspective of investors through money market spreads, which take into consideration the investors' expectations toward liquidity. From regulatory monitoring perspective, Horrath, Seidler & Weill, (2012), Cucinelli (2013), Ramzan (2014), and Brůna and Blahová (2016) adopted the latest liquidity risk measures by BASEL III such as LCR and NSFR in measuring short and longer term liquidity, respectively.

With regard to our focal variable, Buch & Goldberg (2015) showed that the composition of banks' balance sheet and banks' business models influence their responses to liquidity risk, implying that FS may play a role. As none of the previous empirical studies have directly examined the FS-liquidity risk relationship, we deliberated the results from previous studies that examined the impact of FS on

different types of risks. Using a single-factor Capital Asset Pricing Model (CAPM), Ahmad & Mohamad (2004) found that risky sectors affect the market risk exposure of deposit-taking institutions in Malaysia. Meanwhile, comparing the risk behavior of Malaysian Islamic and conventional banks, Abdul-Rahman (2009) and Abdul-Rahman & Shahimi (2010) showed that real estate lending, financing specilization, and stability of short and long term FS, to some degree, affect exchange rate risk and insolvency risk, respectively. In summary, findings from previous literature lent support to the impact of FS on insolvency risk, market risk, and exchange rate risk, but none has done such research on liquidity risk.

Most literature on the determinants for liquidity risk has focused on the bank-specific variables as control variables. Abdel Karim (2013) analyzed liquidity risk for Saudi and Jordanian banks between 2007 and 2011 using the ratio of cash divided to total assets. He found that debt to equity ratio and capital to total assets ratio have positive relationships, while size and loan to deposit ratio have negative relationships with liquidity risk for Saudi banks. Meanwhile, Jordanian banks showed debt to equity ratio, return on asset ratio, capital to asset ratio are positively related to liquidity risk while investment to assets ratio, loan to deposit ratio, and return on equity are negatively related to liquidity risk.

Analyzing liquidity risk of Pakistani domestic and foreign banks for the period of 2001 to 2010, Abdullah & Khan (2012) proxied liquidity risk using capital to total assets ratio. They tested bank-specific variables similar to Mohammad Abdel Karim (2013). Their findings highlighted that size and debt to equity ratio have a positive relationship with liquidity risk for domestic banks, while debt to equity ratio and total loans to total deposits ratio have significant relationships with liquidity risk of foreign banks.

Using a similar liquidity risk measure as Abdullah's & Khan's (2012) but different independent variables, Ahmed, Ahmed & Naqvi (2011) investigated the liquidity risk determinants for Pakistani Islamic banks over the period of 2006 to 2009. They showed that leverage (measured by the ratio of debt assets to total assets), tangibility (measured by fixed assets to total assets), and different establishment age are significant factors affecting liquidity risk of the Pakistani Islamic banks. Their findings were contradictory to Ramzan & Zafar (2014) who also examined Pakistani Islamic banks from 2007 to 2011. By using a different proxy of liquidity risk (the ratio of cash to total assets) but similar independent variables, they found only size is significant in influencing liquidity risk. The different specifications of liquidity risk as well as the time period could be the source of the inconsistent results.

Rather than zooming solely into Islamic banks, some studies have conducted a comparative analysis between conventional and Islamic banks on the same issue (Akhtar et al., 2011; Anam et al., 2012; Iqbal, 2012). Using cash to total asset ratio for liquidity risk, Akhtar et al. (2011) examined Pakistani banks covering a period of 4 years from 2006 until 2009. They analyzed whether networking capital, size, return on equity (ROE), return on assets (ROA), or capital buffer influence liquidity risk. They showed evidence that only ROA has a negative relationship with liquidity risk. Using similar proxies as Akhtar et al. (2011) but with an extended time period covering year 2007 to 2010, Iqbal (2012) added another independent variable, which is non-performing financing (NPF). The results were in contrast to Akhtar et al. (2011) in which all variables are negatively related, while NPF is positively related to liquidity risk for both Islamic and conventional banks. They found that a higher ratio of NPF indicates higher liquidity risk resulted from banks having a huge amount of low quality debt. Banks' failure in debt collection increases liquidity risk because a large number of bad debts reduce liquidity position of the banks.

In addition to that, Anam et al. (2012) compared liquidity risk between Islamic and conventional banks in Bangladesh for a period of 5 years, from 2006 to 2010. They focused on bank-specific variables such as networking capital, size, ROE, ROA, and capital buffer. Adopting cash to total asset ratio in measuring liquidity risk, their findings discovered that size and networking capital are negatively related to liquidity risk for Islamic banks and conventional banks, respectively.

Next, Sulaiman et al. (2013) investigated the determinants of liquidity risk (measured by total deposit to total asset) by considering the economic cycles for the case of Malaysian Islamic banks. Their main contribution to the liquidity literature was in terms of the inclusion of macroeconomics variables since previous studies only took into consideration bank-specific characteristics. In addition to bank-specific variables, they included money supply, 3-months interbank money market rate, inflation rate, and gross domestic product (GDP). Using Generalized Method of Moments (GMM) in estimating dynamic panel regression for 17 Islamic banks for the period covering the year 1994 until 2009, they found that inflation and GDP are inversely related to liquidity risk.[2] They argued that expansionary economy provides a good opportunity for banks to create more income, hence, reducing their exposure to the liquidity risk. The inverse relationship of GDP with liquidity risk is parallel to Cucinelli (2013), who measured liquidity risk via LCR.

The study in the area of liquidity risk is still scarce in the Malaysian context. While Sulaiman et al. (2013) focused on macroeconomic variables, Ariffin (2012) explored the performance-liquidity risk relationship during crisis. Using ROA and ROE for performance measures, she selected the top six Islamic Banks in Malaysia from the year 2006 to 2008, aiming to evaluate banks' performances during the period of crisis. Her correlation analysis showed that during the financial crisis, performance is negatively related to liquidity risk.

In summary, most previous researchers adopted simple liquidity risk ratios in examining various factors on liquidity risk. For instance, Akhtar et al. (2011), Anam et al. (2012), Abdel Karim (2013), Iqbal (2012), Ramzan et al. (2014) used cash to total assets ratio as a proxy for liquidity risk, while Sulaiman et al. (2013) proxied liquidity risk by total deposits to total assets ratio, and Asim and Khan (2012) adopted capital to total assets ratio. Nevertheless, this paper adopts the latest liquidity risk indicators proposed by Basel III, the LCR and NSFR. LCR requires banks to hold adequate high quality liquid assets to withstand liquidity stress within 30 days. Meanwhile, NSFR refers to funding risks that extend beyond loans as well as deter excessive reliance on short-term wholesale deposits (Yi Wu, Elif Ture, Danial & Nicholas, 2014). NSFR also promotes better mobilization of stable sources (Gobat, 2014). Even though Cucinelli (2012) examined LCR and NSFR, this study differs from hers in the sense that she investigated determinants of liquidity risk in the context of European countries and focused on conventional banks; while our study looks at the FS-liquidity risk relationship. In addition, we compare the relationships between conventional and Islamic banks to understand whether similar or different behavior exists in a country that offers a dual banking system. Moreover, we comprehensively consider all independent variables, comprising both bank-specific and macroeconomic variables that have been utilized in previous studies as control variables.

3. Methodology

The research from previous studies provides some basic theory on the relationship of each determinant of liquidity risk. The model developed in this study is a modification of the previous studies. It comprises of both bank-specific characteristics and macroeconomics factors along with our focal variable, FS (*FS*), which are collectively presented in the following equation:

$$LQ_{it} = \beta_0 + \beta_* FS_{i,t} + \beta_1 SIZE_{i,t} + \beta_2 CAR_{i,t} + +\beta_3 ROA_{i,t} + \beta_4 NPF_{i,t} + \beta_5 FIN_{i,t} + \beta_5 GDP_t + \beta_6 INF_t + \alpha_i + \mu_{it}$$

The alternate dependent variables (LQ_{it}) considered two methods proposed by Basel III, namely Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR). Cucinelli (2013) and Claudio (2010) have measured liquidity risk using the same method but different data sampling. As their studies focused on banks in the developed countries (European countries and Italy), ours is on a developing country, Malaysia. In addition to that, to be aligned with the items in balance sheet for Islamic banking, we follow guidelines issued by the Islamic Financial Services Board, namely the

[2] Although GMM is appropriate to solve endogeneity issue of time, Heino Bohn Nielsen (2005) suggests that a large cross section is required for GMM to produce an excellent estimation. Since Ahmad Azam et al. (2013) only have 17 banks, their findings could be challenged in future.

'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' to measure LCR and NSFR of Islamic Banks in Malaysia (IFSB, 2015).

Similar to the study conducted by Abdul-Rahman & Shahimi (2010), our alternate four FS variables ($FS_{i,t}$) are as follows:

1) Real-Estate Financing. A few previous studies have tried to assess the impact of real estate financing to bank risk, but there is still no standard definition for the real estate sector. In order to keep this study in line with the previous studies, this study uses three measures: (i) Financing to Real Estate sector (RE), (ii) Financing to Broad Property Sector (BPS), and (iii) Financing to risky sector (RISKY).
2) Financing concentration (SPEC). Similar to the Herfindahl-Hirschman Index, SPEC is built as follows:

$$SPEC = \sum_{t=1}^{14} s^2{}_{it}$$

Where, s_i is the amount of annual financing in sector *i*. Scores approaching 1 indicates the high level of financing concentration while a score approaching 0 indicates a high level of diversity in the financing portfolio across different sectors.

3) Lending-Composition Change (LCC). LCC reflects the short-term stability in the composition of financing. LCC is generated using the following formula:

$$\text{LCC} = \sum_{i=1}^{14} min\,(s_{it}, s_{it-1})$$

S_{it} is when *i* is the contribution in the amount of annual funding (*t*). It takes a maximum value of 1 if there is no change in the composition of the financing and the minimum value is 0 if the portfolio of financing through financial sector is not funded in the previous year. Therefore, high LCC value indicates short-term stability of the financing composition.

4) *Variance of traditionality index (VART).* VART refers to the stability of medium-term FS. It measures the changes in the financing composition over the medium term. It is the variance of traditionality index (*TI*) that is calculated using the five years intervals for each of the sector involved. TI for 2005 is calculated using the data from the 2003 to 2007, while TI for 2006 used the 2004-2008 data, and so on. Formula for *TI* is as follows:

$$TI_{it} = \frac{\sum_{l=-2}^{l=2} c_{i,t-2}}{5}$$

Where C_i, accumulated financing for each industry is calculated as follows:

$$C_{it} = \frac{\sum_{i=t_0}^{t} e_{it}}{\sum_{i=t_0}^{t_1} e_{it}}$$

Where t_0 and t_1 are the beginning and end of the period for the data, respectively and e_{it} is financing industry *i* in year *t*. VART is the variance of the entire *TI* sector, in which high variance shows different funding patterns in the next 5 years. Meanwhile, low variance signifies a stable loan.

For control variables, we include bank-specific variables: namely, size ($SIZE_{i,t}$), capital adequacy ratio ($CAR_{i,t}$), return on assets ($ROA_{i,t}$), non-performing financing ($NPF_{i,t}$), and financing ($FIN_{i,t}$). We also incorporate two macroeconomic variables: namely, gross domestic product (GDP_t) and inflation (INF_t). The inclusion of control variables are based on the studies conducted by Cucinelli (2013), Sulaiman et al. (2013), Akhtar et al. (2011), Anam et al. (2012), Abdel Karim (2013), Iqbal (2012), and Ramzan & Zafar (2014).

First fixed variable is *SIZE*, which is a logarithm of total assets and it normally increases the liquidity ratio (LCR or NSFR), and reduces liquidity risk of banks. *CAR* is measured by the ratio of Tier 1 capital + Tier 2 capital to risk weighted assets. *CAR* normally measures the bank's financial strength expressed by the ratio of its capital to its risk-weighted credit exposure. A banking institution is required to hold additional capital buffers above 8% as required by the central bank of Malaysia. According to Adalsteinsson (2014), the liquidity reserve is the liquidity available to cover additional funding needs for a defined period of time under stress conditions. Hence, it is expected that *CAR* increases bank liquidity ratio (LCR and NSFR) and reduces liquidity risk. Thirdly, *ROA* is measured by net income divided by total equity. *ROA* measures the profitability of the banks. It also shows the efficiency of the banks in using its assets to generate net income. It is expected that *ROA* increases the liquidity ratio (LCR and NSFR) for banks as they have high profitability to cover the risk, which leads to a decrease of liquidity risk. Fourthly, *NPF* is measured by total non-performing financing divided by total financing. It is a measure of financing quality. Theoretically, a low financing quality reduces profit and liquidity ratio (LCR & NSFR), thus, leads to an increase in liquidity risk. Lastly, *FIN* is measured by total financing divided by total assets. Financing plays an important role in increasing banks' profitability. Banks will generate more profit (which may increase liquidity ratios) with financing obtained from depositor's fund. Nevertheless, higher financing may also lead to insufficient cash to cover any possible losses, which may increase liquidity risk. Similarly, *FS* that relies very much on the unique financing characteristics of an individual bank may increase or decrease liquidity ratio (LCR and NSFR), depending on the business strategy of the bank.

With regard to macroeconomic factors, *GDP* is measured by growth of Gross Domestic Product. *GDP* is commonly used as an indicator of the economic health of a country. For banks, *GDP* can be a key indicator to measure the demand for banking services in the context of receiving deposits and providing financing. Theoretically, a higher *GDP* increases bank liquidity ratio (LCR & NSFR) as citizens have more money circulated in the financial market, thus, decreasing liquidity risk. Another macroeconomic variable, *INF*, is measured by Consumer Price Index. *INF* is the percentage change in the value of the price index on a year-on year basis. It measures the change in the prices of a basket of goods and services in a year. *INF* can affect bank's cost and production. It is expected that higher inflation reduces liquidity ratio (LCR & NSFR) that may increase liquidity risk for banks. The summary of the variable specification and the expected sign of coefficient toward liquidity ratio is presented in Table 1.

Table 1: Mnemonics and Specifications of Variables

Mnemonics	Meaning	Expected Sign of coefficient[3]	Formula
LQ_{it}[1]	*Liquidity Coverage ratio* (*LCR*)		$\frac{High\ Quality\ Liquid\ Asset\ (HQLA)}{Total\ net\ cash\ Outflows\ Over\ The\ next\ 30\ Calender\ days} \geq 100^2$
	Net Stable Funding Ratio (NSFR)		$\frac{Available\ amount\ of\ stable\ funding\ (ASF)}{Required\ amount\ of\ stable\ funding\ (RSF)} \geq 100^2$
FS_{it}	Four alternate measures:		Real estate financing is divided into 3 subcategories, RE, BPS and RISKY. This was followed by the index of specialization (SPEC), short-term loans (LCC) and long-term loans (VART)
	1) real estate financing,	-/+	
	2)financing concentration,	-/+	
	3) short-term financing stability and	-/+	
	4)medium-term financing stability	-/+	
$SIZE_{it}$	Total Asset	+	Log Total Asset
ROA_{it}	Return on Assets	+	Profit After Tax and *Zakat* / Total Asset
NPF_{it}	Non-performing Financing	-	Total Non-performing Financing / Total Asset
FIN_{it}	Financing	-/+	Total Financing / Total Asset
CAR_{it}	Capital Adequacy Ratio	+	Total Capital / Total Asset
GDP_t	The growth of the Gross Domestic Product	+	Value of the growth of the Gross Domestic Product
INF_t	Inflation Rate	-	Value of Inflation

Notes:

1. LCR and NSFR are calculated based on the formula and definition introduced by BASEL III. Specifically, HQLA that comprises of cash or assets that can be transformed into cash at small loss to fulfill its liquidity requests for 30 calendar days (BASEL III, 2013). ASF is the share of a bank's funding structure that is trustworthy for one year, while the RSF is the share of a bank's assets and off balance sheet exposures that are perceived as illiquid for a year; thus, should be supported by stable funding sources (IMF, 2014)
2. LCR is established on 1 January 2015. The minimum requirement is agreed at 60% and increased annually to reach 100% by 1 January 2019. BASEL III requires the value of the LCR ratio always more than 100% (the portion of HQLA should at least equal total net cash outflows) as the expected HQLA is meant to act as a buffer against the liquidity stress (BASEL III, 2013).
3. The expected sign of coefficients toward liquidity ratio (either LCR or NSFR), are opposite to when it is inferred towards liquidity risk

In terms of data sampling, we have collected a sample of all 27 conventional banks and 17 full-fledged Islamic banks for the period from 1994 to 2014. We constructed bank-specific measures using unconsolidated individual bank financial statement data from the Bureau Van Dijk Bankscope database and publicly available audited reports where available. On the other hand, macroeconomic data were retrieved from the websites of Global Market Data Index (GMDI). Using unbalanced panel regression, two models were tested - fixed effect and random effect. The best model is selected based on the Hausman test, Likihood ratio Test, and F--Statistics.

4. Findings and Discussions

Descriptive analysis was conducted to examine the statistical characteristics of each variable to be used as the independent variables in the model. The descriptive analysis shows the mean, median, standard deviation, skewness, and kurtosis Jaque-Bera value. Mean value refers to the average value of the variables for the entire sample and standard deviation or variation refers to the distribution of the scattered data from the mean value. Table 2 panels (a), (b), and (c) show a summary of the basic descriptive statistics of the variables involved in the model for the conventional, Islamic banks, and all commercial banks in Malaysia, respectively.

INSERT TABLE 2

Before conducting panel regression estimations, we run a correlation analysis to ensure our data are free from severe multicollinearity issue. Table 3 panels (a), (b), and (c) show the correlation matrix between the dependent variables (LCR and NSFR) and other independent variables for conventional, Islamic banks, and all banks, respectively. In general, the coefficient correlations for all variables are less than 0.8, conjecturing that multicollinearity problem is not severe for our data sets.

INSERT TABLE 3

Table 4 and 5 show our panel regression results for LCR and NSFR. LCR measures short term liquidity risk within a 30-day period while NSFR measures longer term liquidity risk within a year. As higher values of LCR and NSFR mean that banks hold higher liquidity position, the interpretation towards liquidity risk is reversed from the coefficients in Table 4 and 5. Since our study focuses on liquidity risk (not liquidity position), the following discussion directly deliberates toward liquidity risk exposures.

INSERT TABLE 4 & 5

Based on Table 4 (panel B), the FS variables for the real estate sector (model 1a) and *BPS* (model 1b) for Islamic banking show positive correlations with short-term liquidity risk (LCR), while illustrating insignificant relationship for conventional banking. This implies that an increase in the real estate funding will reduce the liquidity position and increase the liquidity risk of the Islamic banks, but not conventional banks. Meanwhile, it is noted that *LCC* shows a significant positive relationship with liquidity risk of the Islamic banking. When Islamic banking stabilizes its short-term financing structure, it increases its short-term liquidity risk. This result is consistent with the finding by Abdul-Rahman (2009). Given the fact that Islamic banks rely quite heavily on real estate sectors, the increasing liquidity risk may be resulted by negligence in ensuring the financial background of the borrowers. If the borrowers fail to repay the financing, it will directly contribute to the banks exposures to credit risk and eventually increase their liquidity risk, resulted from the failure of the banks to maintain stable income from banking operation to fulfill the demand of the depositors. As our results show evidence that FS does not influence liquidity risk of conventional banks (Table 4 panel A), proper and separate regulations for Islamic banks must be put in place so the banks can avoid losses that indirectly lead to the increase in their liquidity risk exposure. For all commercial banks, comprising of both conventional and Islamic banks in Malaysia, we find that financing to real estate sector has inversely affected short-term liquidity risk, which infers that increasing offering of funding to property sectors can reduce short-term liquidity risk for the overall Malaysian commercial banking institutions.

For bank-specific variables, Table 4: Panel (B) shows a significant positive relationship between *SIZE* and liquidity risk of Islamic banks, implying the bigger the Islamic banks, the higher their short-term liquidity risk. Although most models for conventional banks (panel A) and overall banks (panel C) do not show significant results (except model 4 of panel C), our findings consistently portray that *SIZE* has a positive impact on LCR. Similarly, variable *CAR* also shows significant positive relationships with short-term liquidity risk for the case of Islamic banks. This is in line with the studies of Saidan &

Ismail (2013), where Islamic banks would reduce their liquidity position by increasing the amount of financing as their capital buffer increases, which eventually lead to the increment of their liquidity risk. Note that both conventional (panel A) and overall Malaysian banks (panel C) show inverse relationship between *CAR* and liquidity risk, though not significant.

Next, the *FIN* variables show a significant relationship with liquidity risk. Financing is positively connected to liquidity risk for Islamic Banking, which is parallel with the researches of Sulaiman et al. (2013) and Yaacob, Abdul-Rahman, & Abdul Karim (2015). The increase in total funding will enhance the liquidity risk in Islamic banking. This shows that Islamic banking is negligent in monitoring and collecting their financing would indirectly increase short-term liquidity risk. On the other hand, the variable *FIN* for conventional bank (Table 4 panel A) and overall banks (Table 4 panel C) show a significant negative relation with short-term liquidity risk. Perhaps, conventional banks, which probably dominate the market, are likely to provide financing to those sectors that are less risky but still capable to generate high returns, which finally reduce their liquidity risk.

The findings for both macroeconomic variables, *INF* and *GDP* are in contrary to our initial expectations as well as in contrast with Brůna's and Blahová's (2016), which show weak relationship between macroeconomic factors and LCR, conjecturing that banks experience liquidity shocks in a non-persistent manner. In the current study, all models show a significant positive relationship with *GDP* and short-term liquidity risk and they are consistent with the outcomes of the study by Yaacob et al. (2015), but in contrary to those of the study by Sulaiman et al. (2013) and Cucinelli (2013) in terms of the sign of direction of the relationship. This situation occurs when the economy is expanding and the two banking sectors try to reduce their liquidity positions (which translates to the increase in liquidity risk) in their banks by increasing the supply of financing and promoting the investment to increase their profits. Similarly, the *INF* variable in Table 4: Panel A is in line with the study by Yaacob et al. (2015), in which it shows a significant negative association for Islamic banking as increasing inflation rate will reduce the liquidity risk of Islamic banking. These results indicate that in an inflationary environment, banks will increase their liquidity position (reduce liquidity risk) to protect the depositors and to take the necessary precautions against the occurrence of a "bank run". In contrast, for conventional banking, our result in Table 4: Panel A shows a significant positive effect of *INF* on liquidity risk which is consistent with the findings of Sulaiman et al. (2013) and Cucinelli (2013). The negative coefficient indicates that the bank has to reduce the liquidity position due to the rising costs incurred and is indirectly exposed to higher liquidity risk.

Turning to Table 5: Panel B, it can be seen that financing to real estate sector (model 1a and 1b) shows significant positive relationships toward long-term liquidity risk (within one year) for Islamic banks. This is consistent with the study of Abdul-Rahman (2009). Islamic banking is more likely to offer real estate financing even though it is riskier. Continuous offering of financing in the real estate sector will cause Islamic banks to be exposed to long-term liquidity risk. Next, *LCC* variables show a significant positive "short term FS stability-liquidity risk" relationship for both banking systems. An increase in the supply of financing to customers with lower credit worthiness will reduce liquidity position and increase liquidity risk. On the other hand, the bank may reap the higher return from financing activities by offering financing to the sectors with lower default risk. Against this view, it implies that both conventional and Islamic banks should change their financing portfolios, either across sectors or across financing tenure to reduce liquidity risk exposure.

For conventional banking, based on model 3 (*SPEC*) of Table 5: Panel A, our result shows a significant positive relationship between financing concentration and long-term liquidity risk. Taking together, a stable short-term FS along with increasing financing concentration in certain market segments will increase the liquidity risk of conventional banks. As financing concentration does not play a role in influencing liquidity risk of Islamic banks, medium-term FS stability (*VART*) can inversely affect its liquidity risk. The stabilility of the medium-term FS helps to reduce liquidity risk of Islamic banks.

For the overall Malaysian commercial banking institutions (Table 5 panel C), our results show that all models related to real estate lending (model A-C) show significant positive relationship toward long-term liquidity risk, reflecting that financing provided to property sectors increases commercial banks' liquidity risk. Interestingly, as *SPEC* is not significant for Islamic banks (Panel B), it is significant for both conventional (panel A) and all banks (panel C) but with contradicting sign of directions for the coefficients. Unlike conventional banks, *SPEC* shows an inverse impact on long-term liquidity risk for the overall commercial banks in Malaysia indicating that the current concentration ratio of the overall Malaysian financing portfolio is in a good position as it reduces liquidity risk in the longer time horizon. It could also indirectly imply that the specialization of financing structures for Islamic banks dominates the market causing the overall analysis (panel C) to produce contradicting finding as opposed to conventional banks (panel A).

For the control variables, NPF shows positive significant associations with liquidity risk for Islamic banks (Table 5 panel B) and consistent with the studies by Iqbal (2012). A high ratio of non-performing financing refers to a large number of bad debt. If the banks keep on losing income due to bad debts, they will eventually be exposed to liquidity risk. Similarly, FIN shows significant positive relationships with liquidity risk of Islamic banks (panel B), but not for the conventional banks and overall banks as portrayed in panel A and C, respectively. This shows that granting financing can increase the Islamic banks' liquidity risk. Hence, we suggest that Islamic banks need to start thinking of diversifying their banking activities toward fee-based product offering.

In terms of profitability, our results consistently show that the higher the banks' profitability (*ROA*), the higher will be the liquidity risk for both banking systems and the overall banks. This is consistent with the "high risk-high return" investment concept, but it contradicts the outcome obtained from the study by Akhtar et al. (2011) and Iqbal (2012). This implies that in order for banks to gain a higher return, they have to be involved in risk-taking activities that indirectly increase their exposure to long-term liquidity risk. For capital buffer, our results find that *CAR* is negatively related to liquidity risk for conventional banks, but not for the Islamic banks. Our results support the role of capital buffer in minimizing risk and are consistent with the results obtained by Iqbal (2012), Saidan & Ismail (2013) and Yaacob et al. (2015) although they contradict the results obtained by Sulaiman et al. (2012) and Ramzan & Zafar (2014).

In terms of macroeconomic variables, *GDP* shows no significant relationship for all models of Islamic, conventional, and overall banks. This finding is in line with the study by Mohamad et al. (2012). Despite *INF* not having significant relationship for every conventional banks' model (panel A) and most of the models for overall banks (panel C), it shows significant negative relationships with long-term liquidity risk for Islamic banks (panel B), which is consistent with the studies published by Yaacob et al. (2015). Presuming Islamic banks tend to hold higher liquidity position (to manage its liquidity risk) to hedge against inflation, we feel that Islamic banks are at the disadvantage as they incur opportunity cost for holding extra liquidity.

5. Model Selected and Diagnostic Tests

We also run several specifications. From the descriptive statistics analysis output, it is shown that the Generalized Least Square (GLS) technique is more appropriate and is expected to yield a much better result. The diagnostics test statistics show no evidence of misspecification, no serial correlation, no multicollinearity, and no heterokedasticity. The significant levels reported for the Chow test statistic are 1% and 5%. A low p-value suggests that we are able to reject the null hypothesis. Therefore, we choose the fixed effect model. However, the best model is selected based on the Hausman test and the options are fixed effects model and random effects model. The outputs of All and Large banks are reported to be chi-square with 2 degrees of freedom and significant at 1% and 5%, respectively. Based on these results, we will reject the null hypothesis and prefer the fixed effect approach.

The statistical output also shows the result of heteroskedasticity problem. When we are conducting the Breusch-Pagan test, the null hypothesis is a constant variance. The output shows that it is significant at 99% and 95% confidence intervals, in which we then reject the null, thus, concluding

that there is no problem with heteroskedasticity. Based on the output, our results show that the fixed effect model is better than GLS and random effect model. The diagnostics test statistics show that the fixed effect model is chosen for their focus on the more realistic and policy- relevant effects of bank characteristics on some outcomes. Based on this approach, the individual variable effects can be examined. However, this contradicts with the results obtained for Small banks.

INSERT TABLE 6

6. Conclusion and Policy Implication

We found that the FS, to some degree, shows significant influence with either the short- or long-term liquidity risk exposures of Islamic banks, conventional banks, and overall banks. Firstly, financing to real estate sector is one of the significant variables and it proves that the increasing exposure to the property sector is associated with a higher liquidity risk faced by the Islamic banks. Nevertheless, we suspect that efficient banks may be capable to overshadow this positive relationship, thus, showing insignificant result for conventional banks. Secondly, short-term FS stability (*LCC*) shows a positive relationship with long-term liquidity risk (NSFR) for both banks and overall banks as well as to short-term liquidity risk (LCR) of Islamic banks. Thirdly, financing concentration (*SPEC*) affects long-term liquidity risk (NSFR) of all with the exception of Islamic banks. Finally, medium-term FS stability (*VART*) influences long-term liquidity risk (NSFR) of Islamic banks, nonetheless, not to the others. Responding to our aforementioned complicated findings on various perspectives of FS on both short- and long-term liquidity risk measures in the context of conventional and Islamic banks, we recommend the regulators and practitioners in both banking systems that coexist in Malaysia to carefully consider our discoveries when developing the liquidity risk management framework. Specifically, a separate ruling on liquidity risk framework should be made for conventional and Islamic banking systems as they are exposed to liquidity risk from different channels and factors. For future research, our study may be improved by focusing primarily on real estate financing and issues arising from the increasing Islamic banks' financing on property sectors due to speculations and the effect of investors' sentiment on liquidity risk.

Reference

Abdel Karim, Mohammad. (2013). Liquidity Risk Management: A Comparative Study between Saudi and Jordanian Banks. *Interdisciplinary Journal of Research in Business*, 3(2), 1-10

Abdullah, Asim & Khan, Abdul Qayyum. (2012). Liquidity Risk Management: A Comprative Study between Domestic and Foreign Banks in Pakistan. *Journal of Managerial Science*, 6(1), 62-72

Abdul-Rahman, Aisyah (2010). Three-Factor CAPM Risk Exposures: Some Evidence From Malaysian Commercial Banks, *Asian Academy of Management Journal of Accounting and Finance*, 6(1), 47-67

Abdul-Rahman, Aisyah & Shahimi, Shahida (2010). Credit Risk and FS of Malaysia Islamic Banks, *Journal of Economics Coorperation and Development, 31 (3): 83-105*

Abdul-Rahman, Aisyah, Ibrahim, Mansor, & Mydin Meera, Ahamed Kameel. (2009). Lending Structure and Bank Insolvency Risk: A Comparative Study between Islamic and Conventional Banks, *Journal of Business & Policy Research*, 4(2), 189-211

Abdul-Rahman, Aisyah. (2009). Lending Structure and Market Risk Exposures: The Malaysian Case, *Asian Academy of Management Journal*, 14(2), 1-20

Adalsteinsson, Gudni. (2014). *The Liquidity Risk Management Guide: From Policy to Pitfalls*. United Kingdom, Hohn Wiley & Sons Ltd.

Ahmad, Naveed, Ahmed, Zulfaqar & Naqvi, Imran Haider, (2011). Liquidity Risk and Islamic Banks: Evidence from Pakistan. *Interdisciplinary Journal of Research in Business*. 1(9), 99-102

Ahmad, Nor Hayati & Shahrul Nizam, (2004). Key Factors Influencing Credit Risk of Islamic Bank: A Malaysia Case, *Journal of Muamalat and Islamic Finance Research*, 1(1), 65-80

Ahmad, Norhayati & Arif, Muhamad. (2004). Key Risk Determinants of Listed Deposit-Taking Institution in Malaysia, *Malaysia Management Journal*, 8(1), 69-81

Akhtar, Muhammad Farhan, Ali, Khizer & Sadaqat, Shama. (2011). Liquidity Risk Management: A Comparative Study between Conventional and Islamic Banks of Pakistan, *Interdisciplinary Journal of Research in Business*, 1, 1, 35-44

Anam, Sayedul, Hassan, Shehub, Ahmed, Hussain, Uddin, Azad & Mahbub, Mina (2012). Liquidity Risk Management: A Comparative Study between Conventional and Islamic Banks of Bangladesh. *Research Journal of Economics*, Business and ICT, 5, 1-5

Ariffin, Noraini Mohd. (2012). Liquidity Risk Management and Financial Performance in Malaysia. Empirical Evidence from Islamic Banks. *Aceh International Journal of Social Sciences*. 1(2), 6-75

Blasko, M., & Sinkey, Jr. J. F, (2006). Bank Assets Structure, Real-Estate Lending, and Risk Taking, *The Quarterly Review of Economics and Finance*, 53-81

Brůna, Karel and Blahová, Nad'a. (2016). Systemic Liquidity Shocks and Banking Sector Liquidity Characteristics on the Eve of Liquidity Coverange Ratio Application – The Case of the Czech Republic. *Journal of Central Banking Theory and Practice*, 159-184. DOI: 10.1515/jcbtp-2016-0008

Buch, Claudia M & Goldberg, Linda S. (2015). International Banking and Liquidity Risk Transmission: Lessons from Across Countries. *IMF Economic Review, 63(3)*, 377-410.

Cucinelli, Cucinelli. (2013). The Determinants of Bank Liquidity Risk within the Context of Euro Area. *Intersdisiplinary Journal of Research in Business*. 2(10), 51-64

Drehmann, Mathias & Nikolaou, Kleopatra. (2013) Funding Liquidity risk: Definition and Measurement. *Journal of Banking & Finance, 37*, 2173-2182.

Gobat, Jeanne., Yanase, Mamoru. & Maloney, Joseph. (2014). The Net Satble Funding Ratio: Impact and Issues for Consideration. IMF Working Paper WP/14/106.

Hadenan, Towpek & Joni Tamkin (2006). *Untung dalam Sistem Perbankan Islam*: Kuala Lumpur: Universiti Malaya.

Hasan, Zulkifli. (2006). The Roles and Responsibilities of Shariah Committee of the Islamic Financial Institutions In Malaysia. *Jurnal Syariah*, 14(1), 77-91

Horrath, Roman, Seidler, Jakub, & Weill, Laurent. (2012). Bank Capital and Liquidity Creation Granger-Causality Evidene. Working paper series. No 1947. Retrieved on line at

http://www.ifsb.org/docs/2015-05-20_IFSB%20Islamic%20Financial%20Services%20Industry%20Stability%20Report%202015_final.pdf
https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1497.pdf?7d96921b659d9ef273074f9324c672aa

IFSB. (2015). Islamic Financial Services Industry Stability Report 2015. Retrieved on line at: http://ifsb.org/docs/2015-05-20_IFSB%20Islamic%20Financial%20Services%20Industry%20Stability%20Report%202015_final.pdf.

International Monetary Fund (IMF). 2014. Selected Issues Paper: Chile. IMF Country Report No. 14/219.

Iqbal, Anjum (2012). Liquidity Risk Management: A Comparative Study between Conventional and Islamic Banks of Pakistan. Global Journal of Management and Business Research, 12(5), 55-64Ismal, R. (2010). Assessment of Liquidity Management in Islamic Banking Industry. International Journal of Isllamic and Middle Eastern Finance and Management, 147-167

Iqbal, Sajid, Nasir Chaudry, Saima., Iqbal, Nadeem & Zia, Malik. (2015). Impact of Liquidity Risk on Firm Specific Factors: A Case of Islamic Banks of Pakistan, *Journal of Business and Management Research*, 9, 256-260

Iskandar. Khadijah (2014). *Risk Management in Islamic Financial Institutions*. Kuala Lumpur: IBFIM

Khan, Tariqullah & Ahmed, Habib. (2001). *Risk Management: An analysis of Issues in Islamic Financial Industry*. Islamic Research and Training Institute, Islamic Development Bank, Kingdom of Saudi Arabia.

Man Kit, Shim & Abdul-Rahman, Aisyah. (2011). Penentu Deposit Dalam Sistem Perbankan Islam di Malaysia, *Malaysia Journal of Society and Space*, 7(2), 65-71

Mohamad, Mohammad Taqiuddin, Borhan, Joni Tamkin & Sulaiman, Ahmad Azam, (2012). Islamic Banking Bahaviour in Financing Management in Malaysia, *Asian Journal of Accounting and Governance*. 3, 29-38

Nielsen. Heino Bohn. (2005) Generalized Method of Moments (GMM) Estimation. Retrieved from http://www.econ.ku.dk/metrics/Econometrics2_05_II/Slides/13_gmm_2pp.pdf

Ramzan, Muhammad & Zafar, Muhammad Imran (2014). Liquidity Risk Management in Islamic Bank: A Study of Islamic Banks of Pakistan. *Interdisiplinary Journal of Contemporary Research in Business*. 5(12), 199-215

Rosland, Anitha & Borhan, Joni Tamkin, (2013). Produk Simpanan Berasaskan Ganjaran: Kajian Kes di Bank Islam Malaysia Berhad (BIMB) dan Bank Simpanan Nasional (BSN), *Labuan e-Journal of Muamalat and Society*, 7, 71-82

Rossi, Stefania P.S, Schwaiger, Markus. S & Winkler, Gerhard, (2009). How Loan Portfolio Diversification Affects Risk, Effeciency and Capitalization : A Managerial Behaviour Model for Austrian Banks. *Journal of Banking and Finance, 33*, 2218-2226.

Rudnyckyj, Daromir. (2014). Eonomy in Practice: Islamic finance and the Problem of Market Reason. *American Ethnologist: Journal of the American Ethnological Society*. *41(1),* 110-127. DOI: 10.1111/amet.12063. Retrieve online at: http://onlinelibrary.wiley.com/doi/10.1111/amet.12063/epdf?r3_referer=wol&tracking_action=preview_click&show_checkout=1&purchase_referrer=onlinelibrary.wiley.com&purchase_site_license=LICENSE_DENIED

Ruozi, Roberto & Ferrari, Pierpoalo. (2013). *Liquidity Risk Management in Banks: Economic and Regulatory Issues*. Springer Briefs in Finance, Publishers' Graphic LLC, Italy. 1-54.

Saidan, Amalina & Ismail, Abdul Ghafar, (2013). Pengurusan Kecairan di Perbankan Islam di Malaysia. *Kertas Kerja dibentangkan pada Persidangan Ekonomi Malaysia Ke VIII*, Jilid 1, 59-68

Samsudin, Muhammad Lukman, Abd Halim, Mazzatul Raudah, Mohamad, Mohammad Taqiuddin & Sulaiman, Ahmad Azam, (2012). Pengurusan Kecairan Berdasarkan Berasaskan Aset dan Liabiliti Perbankan Islam di Malaysia. *Kertas Kerja dibentangkan pada Persidangan Ekonomi Malaysia Ke VII*, Jilid 2, 891-905

Shuib, Mohd Sollehuddin, Borhan, Joni Tamkin & Abu Bakar, Azizi (2011). Musharakah Mutanaqisah Home Financing Product: An Implementation Analysis: Product Advantages and Issues at Citibank (Malaysia) Berhad, *Journal of Techno-Sosial*, 3(2)

Sulaiman, Ahmad Azam, Mohamad, Mohammad Taqiuddin, Samsudin & Muhamad Lukman, (2013). How Islamic Banks of Malaysia Managing Liquidity? An Emphasis on Confronting Economic Cycles. *International Journal of Business and Sosial Science*. 4(7), 253-263

Sulaiman, Ahmad Azam, Mohamad, Muhammad Taqiuddin, Samsudin & Muhamad Lukman, (2011). Respon Perbankan Islam Malaysia Terhadap Risiko Kecairan dan Persekitaran Ekonomi. *Kertas Kerja dibentangkan pada Persidangan Ekonomi Malaysia Ke VI*, Jilid 2, 131-141

The American Interest. 2015 . The Euro Crisis Returns: Time for a Bank Run in Greece. Retrieved online at http://www.the-american-interest.com/2015/01/09/time-for-a-bank-run-in-greece/

Vazquez, Francisco & Federico, Pablo. (2015). Bank funding structures and risk: Evidence from the global financial crisis. *Journal of banking & finance*, *61*, 1-14.

Yaacob, Siti Fatimah, Abdul-Rahman, Aisyah & Abdul Karim, Zulkefly (2015). The Determinants of Liquidity Risk: A Panel Study of Islamic Banks in Malaysia, *National Research Seminar 2015*, 705-713

Yi Wu, Elif Ture, Daniel Rodriguez-Delgado & Nicolas Arregui (2014). Chilean Banks' Loan to Deposits Ratio. IMF country Report No. 14/219.

Table 2: Descriptive Analysis

	Panel A: Conventional Banks					Panel B: Islamic Banks					Panel C: All Banks				
	Mean	Std. Dev	Skew ness	Kurtosis	Jarque-Bera	Mean	Std. Dev	Skew ness	Kurtosis	Jarque-Bera	Mean	Std. Dev	Skew ness	Kurtosis	Jarque-Bera
LCR	4.913	40.896	13.584	197.988	713800 ***	0.881	1.488	2.250	38.786	13930 ***	3.431	32.577	17.109	313.505	2842132. ***
NSFR	1.089	3.483	20.044	415.464	3177071 ***	1.026	1.272	9.508	132.691	189710 ***	1.066	2.862	22.910	571.843	9621174. ***
RE	0.262	0.182	0.302	2.132	18.959 ***	0.319	0.253	1.202	4.020	71***	0.284	0.214	1.007	4.279	156.435***
BPS	0.306	0.182	0.017	2.049	15.342 ***	0.380	0.265	0.878	3.114	32 ***	0.334	0.221	0.772	3.738	80.605***
RISKY	0.382	0.229	-0.057	1.900	20.684 ***	0.527	0.247	0.206	2.397	5 ***	0.437	0.246	0.119	2.419	10.835***
LCC	0.841	0.208	-2.618	10.098	1244 ***	0.854	0.210	-1.268	6.356	182 ***	0.846	0.209	-2.074	8.654	1294.729***
SPEC	0.280	0.198	1.946	6.664	484 ***	0.417	0.234	1.432	4.061	97 ***	0.332	0.223	1.627	5.164	419.226***
VART	25.531	132.02	7.014	57.983	39980 ***	0.052	0.040	0.459	2.239	10 ***	16.138	105.555	8.911	92.488	163739.3***
SIZE	6.402	0.709	-0.566	3.525	28***	6.736	1.007	-0.083	4.881	39***	6.526	0.848	-0.060	5.012	120.079***
CAR	0.122	0.153	5.181	40.980	28737***	0.090	0.188	11.744	164.519	284162 ***	0.111	0.167	8.542	111.797	354256.2***
ROA	0.009	0.016	-0.131	43.243	30029***	0.004	0.035	1.050	54.596	29332 ***	0.008	0.026	0.697	77.162	150843.7***
NPF	0.090	0.528	0.150	24.508	1407997 ***	0.022	0.875	5.053	27.863	4621 ***	0.016	1.841	-24.061	601.736	9831804. ***
FIN	0.738	0.340	0.349	18.021	6482 ***	0.893	0.940	7.201	57.310	34595 ***	5.108	1.213	-0.753	3.204	53.037***
GDP	5.305	3.891	-1.780	6.374	568 ***	5.305	3.893	-1.780	6.374	357 ***	0.496	0.211	-0.812	2.762	78.075***
INF	2.619	1.255	0.607	2.816	35 ***	2.619	1.255	0.607	2.812	22 ***	5.305	3.890	-1.780	6.374	926.359***

Note. ***, ** and * is significant at 1%, 5% dan 10% confidence interval

Table 3 (a): Correlation Matrix for Conventional Banks

	LCR	NSFR	RE	BPS	RISKY	LCC	SPEC	VART	SIZE	CAR	ROA	NPF	FIN	GDP	INF
LCR	1.000														
NSFR	-0.108	1.000													
RE	0.111	-0.114	1.000												
BPS	0.092	-0.146	0.971	1.000											
RISKY	0.062	-0.127	0.946	0.968	1.000										
LCC	0.049	-0.091	0.340	0.339	0.358	1.000									
SPEC	-0.014	0.306	-0.291	-0.397	-0.397	-0.245	1.000								
VART	-0.016	0.045	-0.153	-0.160	-0.178	0.073	0.135	1.000							
SIZE	0.116	0.068	0.560	0.559	0.582	0.275	-0.256	-0.033	1.000						
CAR	-0.016	0.163	-0.232	-0.249	-0.277	-0.075	0.187	0.035	-0.166	1.000					
ROA	0.016	-0.332	-0.052	-0.110	-0.083	-0.036	0.053	-0.020	-0.070	0.256	1.000				
NPF	0.002	-0.010	0.044	0.071	0.079	0.059	-0.130	-0.035	0.203	-0.024	-0.032	1.000			
FIN	0.213	-0.025	0.358	0.351	0.373	0.250	-0.240	-0.067	0.673	-0.093	-0.032	0.255	1.000		
GDP	-0.072	-0.046	0.016	0.000	-0.012	-0.043	-0.003	0.019	0.082	-0.063	0.003	0.035	0.013	1.000	
INF	-0.078	-0.021	-0.058	-0.065	-0.046	-0.118	0.112	-0.024	-0.008	-0.062	0.030	-0.068	0.023	-0.083	1.000

Table 3 (b): Correlation Matrix for Islamic Banks

	LCR	NSFR	RE	BPS	RISKY	LCC	SPEC	VART	SIZE	CAR	ROA	NPF	FIN	GDP	INF
LCR	1.000														
NSFR	0.235	1.000													
RE	-0.144	0.163	1.000												
BPS	-0.221	0.143	0.938	1.000											
RISKY	-0.208	-0.005	0.446	0.500	1.000										
LCC	-0.228	-0.090	0.308	0.305	0.025	1.000									
SPEC	-0.014	0.043	0.272	0.195	0.303	0.324	1.000								
VART	0.184	0.097	0.093	-0.053	-0.155	-0.013	0.256	1.000							
SIZE	0.287	0.179	-0.122	-0.187	-0.177	0.153	0.261	-0.149	1.000						
CAR	0.012	-0.264	-0.207	-0.215	-0.272	-0.148	0.033	0.128	0.057	1.000					
ROA	-0.032	-0.012	0.027	-0.016	0.063	0.026	0.154	0.210	-0.163	0.087	1.000				
NPF	0.220	0.144	-0.056	-0.093	-0.239	-0.017	0.158	0.017	0.671	0.271	-0.171	1.000			
FIN	0.293	0.231	-0.093	-0.149	-0.304	-0.002	0.223	-0.021	0.721	0.303	-0.142	0.761	1.000		
GDP	-0.071	-0.040	0.006	0.033	0.097	-0.182	0.032	-0.122	-0.049	-0.129	0.002	0.069	-0.050	1.000	
INF	0.122	0.073	-0.041	-0.036	-0.024	-0.081	-0.042	0.091	-0.158	0.091	-0.096	-0.008	-0.063	0.279	1.000

Table 3 (c): Correlation Matrix for all Banks

	LCR	NSFR	RE	BPS	RISKY	LCC	SPEC	VART	SIZE	CAR	ROA	NPF	FIN	GDP	INF
LCR	1.000														
NSFR	-0.109	1.000													
RE	0.101	-0.090	1.000												
BPS	0.079	-0.108	0.961	1.000											
RISKY	0.049	-0.093	0.842	0.860	1.000										
LCC	0.037	-0.073	0.324	0.327	0.294	1.000									
SPEC	-0.021	0.291	-0.187	-0.262	-0.236	-0.095	1.000								
VART	-0.012	0.032	-0.132	-0.138	-0.175	0.053	0.097	1.000							
SIZE	0.004	0.077	-0.033	-0.059	-0.080	0.018	0.120	-0.020	1.000						
CAR	-0.012	0.127	-0.217	-0.230	-0.276	-0.082	0.149	0.043	0.047	1.000					
ROA	0.021	-0.302	-0.027	-0.086	-0.080	-0.036	0.037	-0.001	-0.095	0.243	1.000				
NPF	0.008	0.046	0.026	-0.019	-0.009	0.005	0.053	0.007	0.002	0.039	0.182	1.000			
FIN	0.003	0.009	0.022	0.030	0.015	0.039	-0.064	-0.030	0.431	0.011	-0.065	-0.011	1.000		
GDP	0.086	0.044	0.089	0.054	0.032	0.089	0.015	-0.032	0.920	0.023	-0.079	0.011	0.485	1.000	
INF	-0.061	-0.048	0.014	0.007	0.004	-0.081	-0.001	0.021	-0.031	-0.067	0.008	-0.019	0.044	-0.019	1.000

Table 4(a): Regression Analysis for Short-term Liquidity Risk (LCR)

	Panel A: Conventional Banks						Panel B: Islamic Banks					
	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
constant	35.448	34.109	39.464	27.721	37.073	15.743	**4.479**	**4.912**	**3.536**	**5.052**	**4.286**	-4.575
	(1.023)	(0.976)	(1.110)	(0.699)	(1.055)	(0.306)	**(2.389)*** **	**(2.622)*** **	**(1.784)***	**(2.680)*** **	**(2.228)** **	(-1.311)
RE	4.171						**-1.478**					
	(0.161)						**(-2.731)*** **					
BPS		6.025						**-1.522**				
		(0.231)						**(-3.094)*** **				
RISKY			-13.320						-0.655			
			(-0.535)						(-1.164)			
LCC				0.698						**-1.207**		
				(0.059)						**(-3.171)*** **		
SPEC					4.970						-0.595	
					(0.312)						(-1.023)	
VART						-0.005						4.830
						(-0.214)						(1.602)
SIZE	-4.492	-4.415	-4.104	-3.120	-4.474	-1.838	-0.373	**-0.424**	-0.251	-0.339	-0.374	0.768
	(-0.822)	(-0.826)	(-0.768)	(-0.515)	(-0.862)	(-0.227)	(1.496)	**(-1.709)***	(-0902)	(-1.350)	(-1.462)	(1.625)
CAR	0.975	1.132	0.034	2.173	0.259	0.999	**-3.388**	**-3.142**	**-3.541**	**-5.017**	**-3.454**	-2.272
	(0.058)	(0.067)	(0.002)	(0.120)	(0.015)	(0.042)	**(1.797)***	**(-1.675)***	**(-1.834)***	**(-2.620)*** **	**(-1.778)***	(-0.762)
ROA	-73.178	-71.765	-75.932	-70.728	-69.069	-89.979	-2.627	-2.413	-1.163	2.123	-1.402	-0.859
	(-0.483)	(-0.473)	(-0.500)	(-0.445)	(-0.452)	(-0.428)	(-0.473)	(-0.439)	(-0.205)	(0.378)	(-0.247)	(-0.121)
NPF	3.69	3.68	3.84	3.76	3.75	4.66	6.38	6.76	4.14	7.92	2.86	-2.11
	(0.995)	(0.993)	(1.037)	(0.987)	(1.015)	(1.057)	(0.427)	(0.456)	(0.271)	(0.532)	(0.186)	(-0.087)
FIN	**4.47**	**4.47**	**4.63**	**4.52**	**4.50**	**6.60**	**-2.24**	**-2.22**	**-2.22**	**-2.00**	**-2.05**	-4.33
	(4.512)* **	**(4.678)*** **	**(4.856)*** **	**(4.668)*** **	**(4.823)*** **	**(4.039)*** **	**(-3.600)*** **	**(-3.603)*** **	**(-3.490)*** **	**(-3.234)*** **	**(-3.166)*** **	(-0.891)
GDP	**-0.996**	**-0.997**	**-1.017**	**-1.120**	**-1.003**	-1.067	**-0.052**	**-0.051**	**-0.052**	**-0.068**	**-0.051**	-0.027
	(-1.773)*	**(-1.774)***	**(-1.805)***	**(-1.842)***	**(-1.784)***	(-1.274)	**(-2.307)** **	**(-2.274)** **	**(--2.254)** **	**(-3.002)*** **	**(-2.226)** **	(-0.982)
INF	**-3.234**	**-3.213**	**-3.429**	**-3.560**	**-3.336**	**-3.745**	0.075	0.072	**0.081**	**0.098**	**0.084**	**0.104**
	(-1.945) **	**(-1.932)** **	**(-0.207)** **	**(-2.045)** **	**(-2.035)** **	**(-1.814)***	(1.585)	(1.533)	**(1.667)***	**(2.012)** **	**(1.734)***	**(1.753)***
R^2	0.216	0.216	0.216	0.217	0.216	0.191	0.416	0.425	0.387	0.430	0.386	0.377
Adj R^2	0.143	0.143	0.143	0.140	0.143	0.106	0.308	0.319	0.275	0.323	0.273	0.203
F-Stat	**2.967*** **	**2.967*** **	**2.967*** **	**2.800*** **	**2.963*** **	**2.239*** **	**3.865*** **	**4.013*** **	**3.436*** **	**4.035*** **	**3.415*** **	**2.164*** **

Note: ***, ** and * is significant at 1%, 5% dan 10% confidence interval. The dependent variable is LCR, measuring short term liquidity position. The higher index means a low bank liquidity risk exposure, thus the relationship between independent variables and liquidity risk exposure is reversed from the coefficient sign in this table.

Table 4(b): Regression Analysis for Short-term Liquidity Risk (LCR)

Panel C: All Banks

	MODEL 1 (A)	MODEL 1 (B)	MODEL 1 (C)	MODEL 2	MODEL3	MODEL 4
constant	3.035	4.416	7.456	8.432	8.548	8.093
	(0.461)	(0.612)	(0.856)	(0.808)	(1.485)	(1.224)
RE	**27.176**					
	(1.679)*					
BPS		19.002				
		(1.162)				
RISKY			7.34			
			(0.451)			
LCC				3.107		
				(0.304)		
SPEC					8.615	
					(0.679)	
VART						-0.005
						(-0.231)
SIZE	-0.784	-0.846	-0.89	-0.910	-0.947	**-0.435**
	(-0.505)	(-0.544)	(-0.571)	(-0.57)	(-0.607)	**(-2.116)****
CAR	1.021	1.224	1.593	1.854	-1.493	1.159
	(0.065)	(0.078)	(0.1)	(0.112)	(-0.092)	(0.056)
ROA	-36.224	-36.848	-43.741	-44.784	-34.458	-80.109
	(-0.30)	(-0.305)	(-0.362)	(-0.357)	(-0.283)	(-0.507)
NPF	-0.192	0.231	-0.158	-0.166	-0.418	0.435
	(0.065)	(-0.079)	(-0.054)	(-0.055)	(-0.014)	(1.152)
FIN	0.387	**0.413**	**0.421**	0.421	0.408	**0.658**
	(1.509)	**(1.613) *** **	**(1.637)***	(1.585)	(1.579)	**(4.270)*****
GDP	-0.614	-0.605	-0.593	-0.628	-0.610	-0.726
	(-1.397)	(-1.374)	(-1.345)	(-1.358)	(-1.380)	(-1.143)
INF	-1.683	-1.788	-1.902	**-2.106**	**-2.013**	-2.417
	(-1.405)	(-1.492)	(-1.583)	**(-1.672)***	**(-1.689)***	(-1.594)
R^2	0.171	0.169	0.167	0.167	0.167	0.181
Adj R^2	0.876	0.85	0.826	0.784	0.83	0.823
F-Stat	**2.05*****	**2.01*****	**1.98*****	**1.89*****	**1.98*****	**1.83*****

Note: ***, ** and * is significant at 1%, 5% and 10% confidence interval. The dependent variable is LCR, measuring short term liquidity position. The higher index means a low bank liquidity risk exposure, thus the relationship between independent variables and liquidity risk exposure is reversed from the coefficient sign in this table

Table 5(a): Regression Analysis for Long-term Liquidity Risk (NSFR)

	Panel A: Conventional Banks						Panel B: Islamic Banks					
	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
constant	-0.844	-0.707	0.653	1.111	-0.902	-0.720	**1.587**	**1.704**	**1.417**	**1.731**	**1.476**	0.311
	(-0.334)	(-0.282)	(-0.260)	(0.400)	(-0.367)	(-1.479)	**(2.784)*** **	**(2.992)*** **	**(2.359)*** **	**(3.013)*** **	**(2.538)*** **	(0.354)
RE	-0.834						**-0.373**					
	(-0.507)						**(-2.263)** **					
BPS		-1.018						**-0.404**				
		(-0.628)						**(-2.691)*** **				
RISKY			-0.409						-0.082			
			(-0.290)						(-0.486)			
LCC				**-3.205**						**-0.247**		
				(-3.207)* **						**(-2.131)** **		
SPEC					**-3.872**						0.065	
					(-3.692)* **						(0.372)	
VART						-2.41						**1.594**
						(-0.106)						**(2.086)** **
SIZE	0.159	0.154	0.121	0.266	0.292	**0.278**	-0.052	-0.065	-0.035	-0.051	-0.052	0.110
	(0.400)	(0.395)	(0.308)	(0.629)	(0.773)	**(3.668)*** **	(-0.681)	(-0.858)	(-0.421)	(-0.660)	(-0.673)	(0.926)
CAR	**8.787**	**8.728**	**8.779**	**7.666**	**9.582**	**1.019**	0.222	0.292	0.172	-0.144	0.127	-0.532
	(7.245)* **	**(7.140)*** **	**(7.079)*** **	**(6.021)*** **	**(8.055)*** **	**(4.221)*** **	(0.387)	(0.513)	(0.293)	(-0.247)	(0.217)	(-0.717)
ROA	**-32.363**	**-32.478**	**-32.456**	**-28.287**	**-36.828**	**-14.596**	**-4.374**	**-4.390**	**-4.224**	**-4.033**	**-4.209**	**-2.999**
	(-2.854)* **	**(-2.867)*** **	**(-2.855)*** **	**(-2.418)*** **	**(-3.297)*** **	**(-7.043)*** **	**(-4.418)*** **	**(-4.471)*** **	**(-4.193)*** **	**(-3.957)*** **	**(-4.181)*** **	**(-2.922)*** **
NPF	5.44	9.32	3.51	1.41	-6.06	-2.18	**-1.77**	**-1.76**	**-1.83**	**-1.75**	**-1.80**	-5.32
	(0.019)	(0.034)	(0.013)	(0.005)	(-0.222)	(-0.501)	**(-3.895)*** **	**(-3.902)*** **	**(-3.949)*** **	**(-3.853)*** **	**(-3.872)*** **	(-0.869)
FIN	7.18	6.37	1.83	1.60	-1.07	**-2.48**	**-1.08**	**-1.08**	**-1.07**	**-1.02**	**-1.08**	-1.82
	(0.104)	(0.093)	(0.027)	(0.234)	(-0.164)	**(-1.655)***	**(-5.731)*** **	**(-5.756)*** **	**(-5.558)*** **	**(-5.398)*** **	**(-5.510)*** **	(-1.474)
GDP	0.019	0.019	0.020	0.010	0.027	-0.001	-0.007	-0.007	-0.008	-0.011	-0.008	-0.004
	(0.451)	(0.444)	(0.454)	(0.208)	(0.640)	(-1.133)	(-1.095)	(-1.054)	(-1.099)	(-1.630)	(-1.160)	(-0.576)
INF	0.118	0.116	0.124	0.098	0.157	0.007	**0.030**	**0.029**	**0.032**	**0.039**	**0.033**	0.012
	(0.923)	(0.913)	(0.975)	(0.747)	(1.270)	(0.328)	**(2.108)** **	**(2.053)** **	**(2.181)** **	**(2.615)*** **	**(2.227)** **	(0.799)
R^2	0.123	0.123	0.123	0.141	0.149	0.208	0.643	0.648	0.629	0.648	0.629	0.573
Adj R^2	0.105	0.106	0.105	0.122	0.131	0.186	0.578	0.585	0.562	0.583	0.561	0.457
F-Stat	**6.934*** **	**6.952*** **	**6.894*** **	**7.588*** **	**8.581*** **	**9.405*** **	**9.925*** **	**10.175*** **	**9.255*** **	**9.987*** **	**9.344*** **	**4.921*** **

Note: ***, ** and * is significant at 1%, 5% dan 10% confidence interval. The dependent variable is NSFR, measuring long term liquidity position. The higher index means a low bank liquidity risk exposure, thus the relationship between independent variables and liquidity risk exposure is reversed from the coefficient sign in this table.

Table 5(b): Regression Analysis for Long-term Liquidity Risk (NSFR)

	Panel C: All Banks					
	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
constant	1.145 (14.362) ***	1.214 **(**13.995**) *****	1.275 **(**12.145**) ****	1.253 **(**10.117**) *****	0.859 **(**12.685**) ****	1.028 (14.148) **
RE	**-0.394** **(-2.012)***					
BPS		**-0.546** **(-2.772)****				
RISKY			**-0.539** **(-2.756)****			
LCC				**-0.250** **(-2.062)****		
SPEC					**0.68** **(4.52)****	
VART						0.388 (0.179)
SIZE	-0.248 (-1.317)	-0.25 (-1.331)	-0.252 (-1.339)	-0.242 (-1.272)	-0.249 (-1.341)	-0.771 (-0.339)
CAR	**0.988** **(5.188) *****	**0.981** **(5.167)****	**0.947** **(4.973)****	**0.904** **(4.624)****	**0.802** **(4.171)****	**0.811** **(3.571)****
ROA	**-9.094** **(-7.427) *****	**-9.147** **(-7.496)****	**-9.158** **(-7.498)****	**-9.03** **(-7.204)****	-8.538 (-7.055)***	**-9.776** **(-6.851)****
NPF	-0.360 (-1.011)	**-0.343** (-0.966)	-0.364 (-1.024)	-0.359 (-1.00)	-0.28 (-0.075)	-0.153 (-0.365)
FIN	**-0.116** **(-3.717) *****	-0.118 **(-3.799)****	**-0.116** **(-3.749)****	**-0.115** **(-3.638)****	**-0.137** **(-4.453)****	-0.241 (-0.141)
GDP	-0.006 (-1.221)	**-0.006** (-1.222)	-0.007 (-1.297)	-0.006 (-1.049)	-0.008 (-1.526)	-0.005 (-0.771)
INF	-0.008 (-0.531)	-0.009 (-0.617)	**-0.009** **(-0.627)***	-0.001 (-0.038)	**-0.006** **(-0.408)**	0.005 (0.308)
R^2	0.394	0.40	0.40	0.405	0.413	0.393
Adj R^2	0.334	0.339	0.339	0.342	0.354	0.32
F-Stat	**6.51****	**6.63****	**6.62****	**6.45****	**7.01****	**5.40****

Note: ***, ** and * is significant at 1%, 5% and 10% confidence interval. The dependent variable is LCR, measuring short term liquidity position. The higher index means a low bank liquidity risk exposure, thus the relationship between independent variables and liquidity risk posure is reversed from the coefficient sign in this table

Table 6: Regression Analysis for Short-term Liquidity Risk (LCR)

	Panel A: Conventional Banks						Panel B: Islamic Banks					
	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
Hausman Test (Test Random vs Fixed effects)	16.75**	16.84**	16.87**	15.81**	16.43**	15.50**	17.18**	17.26**	17.34**	17.39**	17.84**	17.20**
Chow Test (Test None vs Fixed effects)	31.20***	31.57***	31.91***	31.53***	31.40***	4.69**	47.47***	54.18***	46.95**	46.19**	64.64***	41.70**
Breusch-P Test (Test the Heteroskedasticity Problem)	96.85***	96.87***	96.99***	92.30***	96.67***	62.39***	82.62***	81.01***	89.56***	85.22***	98.66***	78.04
Autocorrel: Durbin-Watson Statistic	1.379	1.379	1.383	1.385	1.387	1.386	1.832	1.864	1.774	1.860	1.762	2.353

Note: ***, ** and * is significant at 1%, 5% dan 10% confidence interval

Table 6: Regression Analysis for Short-term Liquidity Risk (LCR)

	Panel C: All Banks					
	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
Hausman Test (Test Random vs Fixed effects)	44.57**	41.59**	44.87**	46.66*	63.81**	81.41***
Chow Test (Test None vs Fixed effects)	43.08*	43.59**	49.32**	50.07**	46.90*	48.02*
Breusch-P Test (Test the Heteroskedasticity Problem)	176.07**	176.32**	175.25*	176.79**	191.80*	155.00*
Autocorrel: Durbin-Watson Statistic	1.328	1.322	1.319	1.322	1.322	1.422

Note: ***, ** and * is significant at 1%, 5% and 10% confidence interval.

Table 6: Regression Analysis for Long-term Liquidity Risk (NSFR)

	Panel A: Conventional Banks						Panel B: Islamic Banks					
	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
Hausman Test (Test Random vs Fixed effects)	18.18**	18.26**	18.34**	19.39**	18.84**	78.20**	20.76**	21.38***	22.42***	19.99**	19.62**	28.93*
Chow Test (Test None vs Fixed effects)	57.47***	58.18***	60.95***	63.19***	61.64***	71.70***	175.04***	176.91***	177.81***	163.04***	128.73**	129.80**
Breusch-P Test (Test the Heteroskedasticity Problem)	102.62**	101.01***	99.56***	95.22**	99.66***	78.04***	279.09***	280.05***	279.84***	272.32***	292.39***	196.49***
Autocorrel: Durbin-Watson Statistic	1.298	1.298	1.302	1.359	1.317	1.482	1.505	1.511	1.467	1.599	1.464	1.699

Note: ***, ** and * is significant at 1%, 5% dan 10% confidence interval

Table 6: Regression Analysis for Long-term Liquidity Risk (NSFR)

Panel C: All Banks

	Model 1 (a)	Model 1 (b)	Model 1 (c)	Model 2	Model 3	Model 4
Hausman Test (Test Random vs Fixed effects)	18.18**	18.26**	18.34**	19.39**	18.84**	18.20**
Chow Test (Test None vs Fixed effects)	57.47***	58.18***	60.95**	63.19**	61.64***	71.70**
Breusch-P Test (Test the Heteroskedasticity Problem)	102.62***	101.01***	99.56***	95.22***	99.66***	78.04
Autocorrel: Durbin-Watson Statistic	1.483	1.494	1.496	1.568	1.493	1.631

Note: ***, ** and * is significant at 1%, 5% and 10% confidence interval.

Highlights

- The financing structure-liquidity risk relationship is proposed.
- The behaviour of the relationships differ between Islamic and conventional banks
- RE and LCC increases both short- and long-term liquidity risks of the Islamic banks
- LCC and SPEC increases long-term liquidity risk of the conventional banks.
- A separate liquidity framework for conventional and Islamic banks is recommended.