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The Effect of Peer-Banks on Bank Liquidity Management: The Case of Islamic Banks in Indonesia

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Abstract. *This study aims to analyze the influence of peer banks on the liquidity management of Islamic banks in Indonesia and whether such influence is robust during the periods of the global financial crisis. This research uses fixed-effect panel data regression with robust standard error and the data of Islamic banks in Indonesia for the years 2007-2020. This research finds that peer-banks have a negative impact on Islamic bank liquidity, and it is robust in the global financial crisis periods. This study contributes to the policymakers and literature regarding the peer bank effect, especially in the liquidity management of Islamic banks. The liquidity management of Islamic banks is not only influenced by the conditions of the Islamic banks themselves but also affected by the behavior of other Islamic banks.*

Keywords: *Islamic Bank; Peer-Bank Effect; Bank Liquidity*

Abstrak. *Penelitian ini bertujuan untuk menganalisis pengaruh peer bank terhadap pengelolaan likuiditas bank sharia di Indonesia dan apakah pengaruh tersebut tetap ada selama periode krisis keuangan global. Penelitian ini menggunakan regresi data panel fixed-effect dengan robust standard error dan data bank sharia di Indonesia tahun 2007-2020. Penelitian ini menemukan bahwa peer-banks berdampak negatif terhadap likuiditas bank sharia, dan pengaruh tersebut tetap ada pada periode krisis keuangan global. Hasil penelitian ini memberikan kontribusi bagi pengambil kebijakan dan literatur mengenai adanya peer bank effect khususnya dalam pengelolaan likuiditas bank sharia. Pengelolaan likuiditas bank sharia tidak hanya dipengaruhi oleh kondisi bank sharia itu sendiri, tetapi juga dipengaruhi oleh perilaku bank sharia lainnya.*

Kata kunci: *Bank Sharia; Peer Bank; Likuiditas*

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Introduction

One of the roles of the financial system is to provide liquidity. Therefore, as financial intermediaries, banks always try to manage their liquidity position to support this role. The liquidity position is a benchmark for assessing the competence of a bank in fulfilling its commitments to depositors. Banks must carefully plan their liquidity position and periodically monitor liquidity risk (Alzoubi, 2017).

The liquidity risk faced by banks can come from the mismatch between demand and the availability of bank funds (Alzoubi, 2017). Banks face imbalances in assets and liabilities that create insolvency risk (Abdul-Rahman et al., 2018). The role of banks as financial intermediaries, which is converting short-term deposits into long-term loans, basically exposes banks to liquidity risk (Berger & Bouwman, 2009). The impact of liquidity risk can reduce bank income and capital and affect solvency.

Liquidity risk was one of the most important causes of the 2007-2009 global financial crisis (Galletta & Mazzù, 2019). During the global financial crisis, there was instability in the banking system. Effective liquidity risk management is important in dealing with liquidity pressure due to financial market turmoil (Abdul-Rahman et al., 2018).

Considering the importance of bank liquidity, several researchers have examined the determinants of bank liquidity. The research of Munteanu (2012) is about liquidity determinants of commercial banks in Romania. Al-Harbi (2017) studies the determinants of conventional bank liquidity in the Organization of Islamic Cooperation (OIC) countries. The study by Nguyen & Vo (2021) is about the liquidity of commercial banks listed on the Vietnamese Stock Exchanges. At the same time, Yitayaw (2021) conducts research on commercial banks' liquidity in Ethiopia. This research detects banks' internal and macroeconomic factors that affect banks' liquidity.

Meanwhile, some other previous studies have shown that a company's financial and operational management are not only determined by the circumstances of the company itself but are also influenced by the behavior of other companies (peer effect). Previous research shows that companies make financial decisions by referring to information from their competitors (Park, 2017). Meanwhile, research on peer effects conducted by previous researchers is mainly on non-financial companies or companies in general (Leary & Roberts, 2014; Grennan, 2019; Kaustia & Rantala, 2015; Park et al., 2017; Shroff et al., 2017). There is still little research on peer effects on financial or banking companies. Research on peer

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effects in banking that has been carried out includes the peer effect on the capital structure of banks in the US (Lee et al., 2017) and peer-influenced on European banks' risk behaviour (Lyócsa et al., 2019). Another study by Bonfim & Kim (2019) on commercial banks and bank holding companies in Europe and North America shows a peer effect on bank liquidity risk management.

A study by Bonfim & Kim (2019) regarding a strong peer effect on bank liquidity risk management shows that banks have collective risk-taking. According to Allen et al. (2012), systemic risk will increase when several banks have similar portfolio decisions because the risk of defaults will be more correlated. Systemic risk is a situation in which many (if not all) financial institutions fail due to common shocks or contagion processes. Contagion is the risk of failure in financial institutions that causes default on other parties through domino effects in the interbank market, payment systems, or asset prices (Allen et al., 2012).

Meanwhile, in countries with dual banking systems, there are Islamic banks with different operational aspects from conventional banks, which must follow the sharia principles (Abdul-Rahman, Sulaiman, et al., 2018; Alzoubi, 2017). Limitations placed on Islamic banks cause the management of liquidity a more complicated task. Islamic banks cannot invest in short-term financial instruments that provide income in the form of interest. Islamic banks also cannot borrow from other banks or financial institutions requiring interest payments on the loans (Alzoubi, 2017). Unlike conventional banks, which often break up the financial and real sector performance, Islamic banks' liquidity risk may arise when the real sector experiences a decline which causes the banks to be unable to conduct l the liquidity management properly (a balance of assets and liabilities). Thus, setting up a liquidity management mechanism in Islamic banks requires extra effort and special attention (Ismal, 2010). Moreover, limited instruments of shariah-compliant money market and shallow money market players have added challenges for Islamic banks in managing efficiently their liquidity risk exposure (Abdul-Rahman, Sulaiman, et al., 2018; Bello et al., 2017).

Research on Islamic bank liquidity management is urgently needed, especially regarding the extent to which peer banks impact the liquidity management of Islamic banks or whether Islamic bank follows others in the decisions making of liquidity management. This is due to the characteristics of Islamic banks that are different from conventional banks and the limitations of sharia-based liquidity instruments faced by Islamic banks (Abdul-Rahman, Sulaiman, et al., 2018; Alzoubi, 2017; Bello et al., 2017; Ismal, 2010). This study also examines the peer-bank effect in the global financial crisis periods for the robustness test. To

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the best of our knowledge, this research will be the first to analyse the influence of peer banks on the liquidity management decision of Islamic banks.

Literature Review

Some research on the determinants of liquidity risk of Islamic banks, among others, is conducted by Alzoubi (2017) on 42 Islamic banks from 15 countries and Mennawi & Ahmed (2020) on Islamic banks in Sudanese. Other research has been done by Mohammad et al.(2020) on Jordanian Islamic banks, Abdelmagid (2020) on Islamic Banks in Saudi Arabia, Ghenimi et al. (2020) on Islamic Banks operating in the MENA region, and Al-Harbi (2020) on Islamic Banks operating in the OIC countries. Whereas the studies by Arfiyanti and Pertiwi (2020), Gogo & Arundina (2021), and Anggraeni & Berniz (2022) were conducted on Islamic banks in Indonesia. Other research has been conducted by Abdul-Rahman, Sulaiman, et al. (2018) on Islamic bank liquidity risk in Malaysia, and Abdul-Rahman, Abdul-Majid et al. (2019) on Islamic bank liquidity risk in Malaysia and Indonesia.

Meanwhile, previous research shows that a company's financial and operational decisions are not only determined by the circumstances of the company itself but are also influenced by the behavior of other companies (peer effect). Previous research shows that companies make financial decisions by referring to information from their competitors (Park et al., 2017). Some of these studies include the effect of peer firms on capital structure (Leary & Roberts, 2014), which shows that leverage is negatively related to peer firm equity shocks of peer firms. Decisions to issue debt and equity are negatively and positively associated with peer-company equity shocks. The research on peer effect on dividend decisions (Grennan, 2019) indicates that peer effect is important in increases but not decreases of dividend payment. Peer effect study on decisions to do stock splits (Kaustia & Rantala, 2015) shows that companies are more likely to split their shares if their peer companies have recently done so. The study of the peer effect on investment decisions (Park et al., 2017) shows that more financially constrained firms rely more on peer investment decisions. The research on peer effect on the cost of capital (Shroff et al., 2017) shows that the peer information environment is negatively related to a firm's cost of capital when publicly available firm-specific information is lacking.

In the meantime, research on peer effects in banking is still limited. The studies that have been carried out include the peer effect on the bank capital structure (Lee et al., 2017), and bank liquidity (Lyócsa et al., 2019; Bonfim & Kim, 2019).

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The literature reviews show gaps in research about whether peer effect determines the liquidity management of Islamic banks. Regarding the different characteristics between Islamic and conventional banks and the limitations of liquidity instruments for Islamic banks (Abdul-Rahman, Sulaiman, et al., 2018; Alzoubi, 2017; Bello et al., 2017; Ismal, 2010), this research contributes by providing empirical evidence about the influence of peer effect on Islamic bank liquidity management decisions.

Methods

This study uses yearly unbalanced panel data from thirteen (13) Islamic banks in Indonesia from 2007 to 2020. This research uses Indonesian Islamic bank data because Indonesia is the country that has the largest population of Muslims. Then the establishment of Islamic banks in Indonesia could not be ruled out. The list of Islamic banks is as follows:

Table 1. List of Islamic Banks

Islamic Banks
Bank Muamalat Indonesia
Bank Sharia Mandiri
Bank Sharia Mega Indonesia
Bank Rakyat Indonesia Sharia
Bank Sharia Bukopin
Bank Victoria Sharia
Bank Negara Indonesia Sharia
Bank Panin Sharia
Bank Central Asia Sharia
Bank Jabar Banten Sharia
Bank BTPN Sharia
Bank Aceh Sharia
Bank NTB Sharia

This study uses fixed-effect panel data regression (Equation (1)) with robust standard error to analyze peer-bank effect on the liquidity of Islamic banks, which are:

$$LQ = \beta_0 + \beta_1 PB_{i,t} + \sum \gamma_n CONTROL + e_{i,t} \quad (1)$$

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The detail of the variables are as follows:

Table 2. Variable Description

Variable	Measurement	Reference
Dependent Variable		
Liquidity (LATA)	Liquid Assets to Total Assets	Roman & Şargu, 2014; Mahdi & Abbes, 2018; Ghenimi et al., 2020
Independent Variable		
Peer Bank Effect (PLATA)	Average Liquidity of Other Islamic Banks	Bonfim & Kim, 2019
Bank-level Control Variable:		
Credit Risk (NPF)	Non-Performing Financing to Total Financing	Ghenimi et al., 2020
Profitability (ROA)	Return on Assets	Alzoubi, 2017
Equity (CAP)	Equity to Total Assets	Alzoubi, 2017
Country-level Control Variable:		
GDP Growth (GDP)	GDP Growth	Hameed et al., 2019
Inflation Rate (INF)	Inflation Rate	Laurine, 2013
Real Interest Rate (RIR)	Real Interest Rate	Dabiri, Yusof, & Wahab, 2019
Broad Money Growth (BMG)	Broad Money Growth	Rashid et al., 2017

The dependent variable LATA is Liquid Assets to Total Assets (Roman & Şargu, 2014; Rashid et al., 2017; Mahdi & Abbes, 2018; Ghenimi et al., 2020). We use Liquid Assets to Total Assets as the liquidity proxy because it is the most popular indicator of bank liquidity (Ghenimi et al., 2020). This ratio describes the proportion of liquid assets to total assets. The higher this ratio, the better the bank liquidity or the lower liquidity risk because it shows that banks keep more liquid assets out of total assets (Tran & Nguyen, 2019).

The peer-bank effect (PLATA) is measured by the average liquidity of other Islamic banks (competitors) in the Indonesian Islamic banking industry (Bonfim & Kim, 2019). This variable's significant influence indicates the influence of peer-bank on Islamic bank liquidity management.

CONTROL is control variables consisting of bank-level and country-level control variables. Bank-level control variables are (1) Credit Risk (NPF), measured by Non-Performing Financing to Total Financing (Ghenimi et al., 2020); (2) Profitability (ROA), which is Return on Assets (Alzoubi, 2017); and (3) Equity (CAP), which is Equity to Total Assets (Alzoubi, 2017). The country-level control

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variables are (1) GDP is GDP growth (Ahamed, 2021); (2) BMG is the Broad Money Growth (Rashid et al., 2017); (3) RIR is Real Interest Rate (Dabiri et al., 2019); and (4) INF is the inflation rate (Laurine, 2013).

For further analysis, this research also analyzes whether the peer-bank effect is robust in the global financial crisis period. It uses a crisis dummy to reflect the possible impact of the 2008 Global Financial Crisis. The crisis dummy equals 1 for the financial statement years 2008 and 2009 (Louhichi & Boujelbene, 2016; Amin et al., 2018).

Results and Discussion

Based on descriptive statistics in Table 3, the average liquidity of Liquid Assets to Total Assets (LATA) for all Islamic banks in the sample is 0.27863. The highest and lowest liquidity are 0.64510 and 0.12019, respectively. The value of the standard deviation of liquidity is 0.08657. The average of peer-bank liquidity, which is peer-bank Liquid Assets to Total Assets (PLATA), is 0.27857. The lowest and highest peer-bank liquidity are 0.14538 and 0.37302, respectively. The standard deviation value is 0.04269. The average peer bank liquidity (PLATA) is just slightly lower than the average bank liquidity (LATA).

Table 3. Descriptive Statistics

	Average	Maximum	Minimum	Std Dev.
LATA	0.27863	0.64510	0.12019	0.08657
PLATA	0.27857	0.37302	0.14538	0.04269
NPF	0.03520	0.22040	0.00000	0.02883
CAP	0.12946	0.35770	0.05480	0.06580
ROA	0.00922	0.13580	-0.10770	0.02588
INF	0.04573	0.10227	0.01921	0.01861
GDP	0.04610	0.06345	-0.02070	0.02297
BMG	0.11159	0.19325	0.06290	0.03466
RIR	0.06488	0.10040	-0.03852	0.03368

Source: Processed (2022)

The average percentage of bank-level control variables, Non-Performing Financing (NPF), is 3.5%, ranging from 0.0% to 22%. The standard deviation

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of Non-Performing Financing (NPF) is 2.88%. The average Equity to Total Assets Ratio (CAP) proportion is 12.9%, varying from 5.48% to 35.77%. The Equity to Total Assets Ratio (CAP) standard deviation is 6.58%. The Return on Assets (ROA) has an average percentage of 0.9%, with the minimum and maximum values being -10.77% and 13.58%, respectively. The standard deviation of Return on Assets (ROA) is 2.58%.

Meanwhile, for the country-level control variables, the average value of the Inflation Rate (INF) is 4.57%, which ranges between 1.9% and 10.23%. While the standard deviation of the Inflation Rate (INF) is 1.86%. The average GDP growth (GDP) is 4.6%, and it ranges from -2.07% to 6.34%. Then the standard deviation of GDP growth is 2.29%. The average Broad Money Growth (BMG) is 11.1%, with the minimum and maximum values are 6.29% and 19.32%, respectively. The standard deviation of Broad Money Growth (BMG) is 0.03466. The Real Interest Rate (RIR) has an average percentage of 6.5%, varying from -3.8% to 10%. Whereas the standard deviation of Real Interest Rate (RIR) is 3.37%.

Table 4. Correlation Matrix

	PLATA	**NPF**	**CAP**	**ROA**	**INF**	**GDP**	**BMG**	**RIR**
PLATA	1.00							
NPF	-0.02	1.00						
CAP	0.22	-0.25	1.00					
ROA	0.11	-0.46	0.44	1.00				
INF	-0.6	0.03	-0.29	-0.10	1.00			
GDP	-0.59	0.02	-0.24	-0.06	0.55	1.00		
BMG	-0.18	-0.16	-0.26	-0.08	0.39	-0.04	1.00	
RIR	-0.01	0.04	0.26	0.010	-0.60	-0.48	-0.41	1.00

Source: Processed (2022)

Table 4 presents the correlation matrix of the independent variables used in this study. Based on Table 4, the correlations between the independent variables are smaller than 80%. It shows no problem of multicollinearity in this study.

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Table 5. Regression Results

	(1) Coefficient (std. error)	(2) Coefficient (std. error)
PLATA	-1.023	-1.020
	(0.287)***	(0.281)***
NPF	-0.410	-0.403
	(0.587)	(0.576)
CAP	0.314	0.313
	(0.253)	(0.252)
ROA	-0.884	-0.874
	(0.578)	(0.556)
INF	-2.209	-2.240
	(0.453)***	(0.449)***
GDP	-2.239	-2.211
	(0.532)***	(0.543)***
BMG	-0.890	-0.880
	(0.391)**	(0.392)**
RIR	-1.867	-1.841
	(0.351)***	(0.329)***
CRI		0.007
		(0.021)
Constant	0.970	0.966
	(0.140)***	(0.137)***
R-squared	0.2699	0.2703
F-Statistics	15.95	39.22
Prob. (F-Stat.)	0.000	0.000
No. of Obs. (bank-year)	129	129

Note: * significant at 10%; ** significant at 5%; *** significant at 1%
Source: Processed (2022)

Table 5 shows the fixed-effects panel data regression results of the peer-bank effect on Islamic bank liquidity in Indonesia. Based on Equation (1), the results in Table 5 column (1) show that peer-banks liquidity has a negative effect on Islamic bank liquidity. The negative effect of the peer-bank liquidity shows that the higher the liquidity of peer-banks will decrease Islamic bank liquidity.

We add the variable of a global financial crisis (CRI) to the Equation for the robustness test. Table 5 column (2) results show that the global financial crisis

(CRI) does not significantly influence Islamic bank liquidity. The results in column (2) reinforce the results in column (1) that peer-bank liquidity negatively influences Islamic bank liquidity. The impact of peer-bank liquidity on Islamic bank liquidity remains robust during the global financial crisis periods.

Meanwhile, Table 5 also shows the results of the control variables influences. All bank-level control variables which are Credit Risk (NPF), Equity (CAP), and Profitability (ROA) do not have a significant impact on Islamic bank liquidity. Whereas, all country-level control variables, which are the Inflation Rate (INF), GDP growth (GDP), Broad Money Growth (BMG), and Real Interest Rate (RIR) have negative impacts on the liquidity of Islamic banks. The results of the control variables in column (2) also support the results in column (1). The negative effects of the country-level control variables are in accordance with previous research. The negative impact of the Inflation Rate (INF) corresponds with the research of Ahamed (2021) and Laurine (2013). The negative influence of GDP growth (GDP) is consistent with the study by Dabiri et al. (2019). The negative effect of Broad Money Growth (BMG) is in accordance with the research by Rashid et al. (2017). While the negative influence of Real Interest Rate (RIR) is consistent with the research of Dabiri et al. (2019).

The significant impact of the peer bank on Islamic bank liquidity is in accordance with previous research that a firm's financial and operational decisions are not just influenced by the conditions of the firm itself but are also affected by the behavior of other companies (peer effect) (Leary & Roberts, 2014; Park et al., 2017; Lee et al., 2017). It is also in accordance with the peer effect research on bank liquidity risk management of commercial banks and bank holding companies in Europe and North America (Bonfim & Kim, 2019) and peer effect on bank's liquidity transformation activity of cross-country OECD banks (Silva, 2019). However, the research of (Silva, 2019) shows the positive influence, and the research of Bonfim & Kim (2019) shows positive and negative influences of peer effects.

However, the negative influence of peer-bank corresponds with the research of Lee et al. (2017) about financial institution's leverage decisions. The negative impact of the peer-effect is also in accordance with the research of Shroff et al. (2017) on the cost of capital and the study of Wang et al. (2021) on the peer-effect on the loan portfolio of big-six and shareholding commercial banks.

Based on the research of Wang et al. (2021), the negative peer effect on most lending shares of the big six and shareholding commercial banks implies that banks in these two classifications tend to conduct their loan portfolio strategies in

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opposite directions compared to their peers. The negative peer effect regarding the big six and shareholding commercial banks suggests that they are likely to interact with peers through other channels that need to be explored further.

According to Shroff et al., (2017), firms within an industry are influenced by common economic forces (eg, general supply/demand shocks). Thus, peer disclosure has a spillover effect that decreases information asymmetry between managers and investors and between investors for all companies operating in the industry. Reduction in information asymmetries can decrease financing costs (both in debt and equity markets), as defined in corporate finance models with adverse selection. Then, according to the study of Shroff et al. (2017), peer firms will negatively affect the cost of capital.

Based on the study of Lyócsa et al. (2019) about peer influence on financial leverage, the peer bank will give a negative or positive influence depending on whether the company's performance is above or below some aspiration (benchmark) level. Bank performance above/below the benchmark level tends to reduce or increase its performance (Lyócsa et al., 2019).

Meanwhile, according to Bonfim & Kim (2019), the negative or positive effect of peer-bank depends on the size of the bank. Small banks sometimes reduce liquidity risk when the largest banks are raising it (Bonfim & Kim, 2019). The study by Bonfim & Kim (2019) obtains a negative peer effect in some specifications. In the case of Bonfim & Kim (2019), the small banks reduced liquidity risk when the biggest banks increase it. It seems that among smaller banks, collective risk-taking strategies are not prevalent. These banks do not appear to copy liquidity risk management strategies among themselves or the biggest banks.

In the case of Islamic banks in Indonesia, based on the descriptive statistics in Table 3, the average liquidity of Islamic banks in Indonesia ranges between 0.12019 and 0.64510. It means there are Islamic banks in Indonesia that have high and low liquidity. Meanwhile, in the situation of the Islamic banking industry in Indonesia which is still growing, there are small and big Islamic banks. This condition can have negative influence on peer effect when Islamic banks that have different size and different level of liquidity conduct liquidity management strategies in opposite ways compared to their peers (Bonfim & Kim (2019); Lyócsa et al. (2019); Wang et al. (2021)).

Furthermore, Islamic banks should follow sharia principles in liquidity management, which make Islamic banks cannot invest in financial instruments that give interest income and borrow from other banks or financial institutions

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that demand interest payments, like conventional banks. Sharia-based liquidity instruments of Islamic banks, among others, are the Islamic inter-bank money market with *wadī'ah* contracts and *muḍārabah* certificates between Islamic banks. The limitations placed on Islamic banks make liquidity management a more difficult and potentially cause information asymmetry. Peer effects have a negative influence on the liquidity of Islamic banks. So, if the liquidity of peer banks is higher, the Islamic banks will decrease their liquidity. It might imply that the Islamic banks take advantage and seek profits by selling their liquidity in the money market, and the peer banks with higher liquidity will purchase it.

Conclusion

This study has examined the peer-bank effect on Islamic bank liquidity decisions. Using Indonesian Islamic banks data, this study comes to several conclusions based on the result and discussions. Peer-banks liquidity negatively impacts Indonesian Islamic bank liquidity decisions (Liquid Assets to Total Assets), and its impacts are still robust during the global financial crisis. Based on this research, the liquidity management of Islamic banks in Indonesia is influenced by other Islamic banks in the Indonesian Islamic banking industry. The negative impacts of peer banks on Islamic bank liquidity means that the higher the liquidity of the peer banks will make the Islamic banks decrease their liquidity. The implication of this research to the literature and policymakers is regarding the presence of peer bank effects, especially in the liquidity management of Islamic banks. Islamic bank liquidity decision is not only influenced by the condition of the Islamic bank itself but also by the behavior of other Islamic banks. Since this study only reaches the impact of peer-bank on Islamic bank liquidity decisions, further research can be done to explore more the cause of Islamic banks following their peers in liquidity management.

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