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THE IMPACT OF FUNDING LIQUIDITY ON EUROPEAN BANK RISK - TAKING BEHAVIOUR

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Abstract

Funding liquidity as the bank ability to generate funds by disbursing assets to meet short-term financial liabilities is very important because of bank intermediary activities. This study conduct to measure the effect of funding liquidity on bank risk-taking behaviour. We used the panel data regression method for data processing with Pooled Least Square (PLS), Fixed Effect Model (FEM), and Random Effect Model (REM). As this study uses bank data from different countries as well as banking and regulatory conditions that different over time, it is predicted that regression parameters are not constant between time and sample. The data period of public-listed commercial bank in Europe are from 2004 to 2016.The result of this study shows that the problem of low profitability in European banks may trigger banks to take bigger risks to achieve higher profits. These results indicate that European banks with higher levels of funding liquidity tend to have more aggressive risk-taking behavior in the future. Bank risk-taking behavior in response to increased liquidity was generally lower during the global financial crisis period. This could be due to increased risk aversion and a tighter monitoring process during this period.

Keyword: *Funding Liquidity, Bank Risk-Taking Behaviour*

1. INTRODUCTION

Liquidity risk is major problemfor bank financial intermediary business model. The illliquidity could harm business sustainability of banks and even push to financial constrain and bankcruptcy. With high liquidity, bank tend to take higher risk to implement various business scenario.

Bankeager to take higher risks by less stringent analyses to raise credit volume because the liquidity risk decreases as thehigher deposit inflow butin the long-term the risks tend ariseto the danger level for the bank.

This study investigates the relationship between funding liquidity and bank risk-taking behaviour in Europe. There is significant impact on the economy from the risk-taking behaviour of banks that has been demonstrated by several global financial crisis. The global banking regulatory reforms focus on bank liabilities to be more liquid than before, an understanding of possible relationships in funding liquidity and risk-taking behaviour becomes important.

Several studies have shown a more aggressive risk-taking behavior by banks when they experience an increase in funding liquidity. Khan et al. (2017) in their research using data in the United States. In the 2017 IMF report also stated that the problem of low profitability in European banks could also trigger banks to take greater risks to achieve increased profits, for example by looking for assets that offer higher returns or providing loans to borrowers who are less feasible with spreads. higher.

Literature Review

Gomes and Khan (2011) state that funding liquidity is the ability of a company to generate funds by disbursing assets held on the balance sheet to meet short-term financial obligations. The liquidity position of a bank is determined primarily by its cash holdings and marketable assets available, its funding structure, and the

amount and type of contingent liabilities that mature in a certain period. Funding liquidity also define as the ability of solvent institutions to make payments that have been agreed upon in a timely manner (IMF, 2008).

The need for banks to hold liquidity as insurance against withdrawals of funds that may occur at any time, depends on the regulations set by the state and also factors of market imperfections that limit the bank's ability to raise funds immediately. This constraint indicates that banks cannot collect all their funds externally and therefore must have liquid assets in reserve. Because banks with large market power experience less financial friction in accessing the funding market, they can hold less liquidity and invest in illiquid loans that provide high returns. Therefore, when banks have a large market power in the funding market, they can become more aggressive by providing loans to risky borrowers to increase their credit market share and asset base. By raising higher lending rates, these banks exacerbate the problems of moral hazard and adverse selection (Nguyen et al, 2017).

Acharya and Viswanathan (2011) developed a model based on the assumption that financial institutions increase debt to finance their assets and this debt must be rolled over constantly. The higher the debt in the bank system, the higher the risk of bank run. During a crisis where asset prices deteriorate, banks will have more difficulty in rollover their debts, so they will experience liquidity problems. When banks experience shocks in their funding liquidity, De Haan and Den End (2012) state that there are three common responses. First, reduce lending, both retail and wholesale. Second, selling securities from its investment portfolio; and third, accumulate liquidity by accumulating deposits at the central bank. The liquidity buffer can also be strengthened by holding more liquid bonds.

Previous empirical research that has examined the relationship between funding liquidity and risk taking is the research of Khan et al. (2017). Using quarterly data from Bank Holding Companies (BHC) in the United States for the period 1984-2014, they found that banks that had a lower funding liquidity risk as measured by a higher deposit ratio took a greater risk.

Based on these theories and findings, the first hypothesis in this study was developed as follows:

H1: European countries with developed financial systems, banks with a higher level of funding liquidity tend to have more aggressive risk-taking behavior in the future.

H2: The effect of funding liquidity on banking risk taking will weaken further during the global financial crisis.

2. METHODOLOGY AND DATA

Some of the panel data estimation techniques commonly used are Pooled Least Square, Fixed Effect Model, and Random Effect Model. In the Pooled Least Square model, panel data is treated and estimated like cross section data. Generally estimating in this way will result in a low Durbin-Watson d statistic indicating the presence of autocorrelation in the data. This could happen because the data is recorded over time, which is likely to have a strong correlation between times (lag). Meanwhile, the fixed effect model (FEM) makes it possible to capture differences between cross sections because the regression model is formed with different interceptions for each individual while the slope coefficient is assumed to be the same. One of the weaknesses of the fixed effect model is the large number of dummy variables that need to be used so that the degree of freedom is eroded. Another variation of the panel data regression model is the random effect model. The Random Effect Model (REM) does not use a dummy variable to show the difference in intercept between individuals but rather adds a different random number for each individual (εi) to one constant intercept. So, in FEM, each individual has their own fixed intercept value, whereas in REM, the intercept reflects the average intercept in the population and the error component εi reflects the intercept deviation of each individual from the population mean where the amount is random. (Wibowo, 2013)

Because this study uses bank data from different countries as well as banking conditions

and regulations that change rapidly over time, it is assumed that the regression parameters are not constant over time and between sample. To determine the use of the FEM or REM model, this research will use a formal test that is commonly used, namely the Haussman Test.
In the Hausman Test, the following hypothesis is used:
H_0: using the Random Effect Model (REM)
H_1: using the Fixed Effect Model (FEM)
If the p-value is less than 1%, then the Fixed Effect Model (FEM) is more appropriate. If not, then the Random Effect Model (REM) will be used.

Table 1. Haussman Test

Var.Dependent	Chi.Sq. Stat	Prob.	Regression Model
RWA	117,880	0,000	Fixed Effect
LLP	53,332	0,000	Fixed Effect
Z-Scores	41,484	0,000	Fixed Effect

Table 1 shows the results of the Hausman Test performed. The results show that the p-value for all risk measures is less than 1% level of significance. Thus, the panel data regression model that is preferably based on Hausman Test is a FEM for all risk measures (RWA, LLP, and Z-Scores). Therefore, the regression equation used is as follows:

$$Risk_{i,t} = \beta_1 \ Liquidity_{i,t-1} + \beta_2 \ Controls_{i,t-1} + \gamma_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

Where $Risk_{i,t}$ is the risk variables use three different risk measures, namely risk-weighted assets, loan loss provision, and Z-score. $Liquidity_{i,t-1}$is the banks funding liquidity risk variable as measured deposit rates. Deposit is considered as a measure of funding liquidity because the deposit protects banks from the risk of a bank run. In order to control the influence that may affect the relationship between funding liquidity and risk-taking other variables, this research also uses total assets, total equity, return on assets (ROA), and total loans; which are the variables that are likely to affect bank risk. Macroeconomic variables are also used as control variables such as the growth of gross domestic product (GDP), the change of policy interest rate.
This study includes the dummy variable of the global financial crisis (GFC) period as a moderating variable. The GFC variable will be worth 1 for the 2007-2010 period data which is the period of global crisis and is 0 for data beyond that period.
The test for GFC as control variable is done with the REM using the equation 2as follows:

$$Risk_{i,t} = \alpha + \beta_1 GFC_{i,t} * Liquidity_{i,t-1} + \beta_2 GFC_{i,t} + \beta_3 Liquidity_{i,t-1} + \beta_4 Controls_{i,t-1} + \omega_{i,t}; \ \omega_{i,t} = \varepsilon_i + \nu_{i,t} \quad (2)$$

The selection of countries and banks to be used as research samples is based on the availability and completeness of the data. Here the sample used in this study consists of 62 European banks from 10 countries, which can be seen in table 2 as follows:

Table 2. The research samples

Country	Number of Bank
Austria	5
Denmark	7
French	4
German	3
Italy	11
Norway	11
Spain	4
Sweden	4
Switzerland	8
United Kingdom	5

3. RESULTS

As shown in Table 3, deposits in Europe are in the range of 46.6% with a standard deviation of 0.159, a large gap with the overall average deposit rate of 71.5%. Meanwhile, the minimum deposit value is 0.055.
For the risk-taking variable, European data also shows lower risk-taking, where the RWA is only 51.8% compared to the data for the entire sample which has an average of 62.2%. The maximum RWA value reaches 1,062 to total assets. Loan loss provisions (LLP) have an average of 0.3% with the lowest value being -0.4%.The mean log

z-scores had a higher than the overall mean of 2.259 which indicates a lower risk.

Table 3. Descriptive Statistics

Variables	Mean	Std. Dev	Min	Max	Obsv.
Dependent Variables					
RWA	0,518	0,182	0,034	1,062	796
LLP	0,003	0,004	-0,004	0,044	796
Z-Score	2,259	0,54	0,92	4,321	796
Independent Variables					
Deposit	0,466	0,159	0,055	0,894	796
Control Variables					
Asset	18,53	1,99	14,458	22,58	796
Loan	0,654	0,194	0,093	0,939	796
Equity	0,067	0,029	0,014	0,188	796
ROA	0,005	0,006	-0,044	0,025	796

Table 4. Funding Liquidity and Bank Risk in Europe

	RWA	LLP	Z-Scores
Deposit	0,177***	0,003	0,204
	(0,000)	(0,187)	(0,432)
Asset	0,035***	0,001	0,124
	(0,009)	(0,545)	(0,119)
Loan	0,011	0,005 ***	0,238
	(0,799)	(0,004)	(0,361)
Equity	0,887***	-0,02**	0,035
	(0,000)	(0,047)	(0,980)
ROA	2,112***	-0,139***	16,053***
	(0,002)	(0,000)	(0,000)
GDP	0,001	0,001	-0,04
	(0,643)	(0,221)	(0,010)
Rate	0,005	-0,001	0,03
	(0,448)	(0,002)	(0,441)
Constant	1,005***	-0,003	-4,51***
	(0,000)	(0,744)	(0,004)
Observations	799	801	804
Adjusted R-Sq	0,869	0,531	0,471

A positive relationship between funding liquidity and risk can also be seen when using European bank data as shown in table 4. This positive relationship is only significant for the Risk Weighted Asset (RWA) variable.

The results shown reinforce the IMF's (2017) statement which states that the problem of low profitability in European banks can trigger banks to take bigger risks to achieve increased profits. These results also support the first hypothesis in this study, namely that in Europe, which generally has a more advanced financial system, banks with a higher level of funding liquidity tend to have more aggressive risk-taking behavior in the future.

Table 5. Funding Liquidity and Bank Risk during the Global Financial Crisis Period

	RWA	LLP	Z-Scores
Deposit*GFC	-0,079**	-0,001	-0,028
	(0,021)	(0,412)	(0,886)
GFC	0,062***	0,001	0,096
	(0,000)	(0,891)	(0,134)
Deposit	0,014	0,001	0,086
	(0,714)	(0,940)	(0,674)
Observations	799	801	804
Adj R-Sq	0,387	0,187	0,096

If we pay attention to the relationship between funding liquidity and bank risk during this crisis period, the test shows the results in accordance with the hypothesis that the negative relationship between deposits and risk during the crisis period was also found to be significant in the European region. Estimation results in Europe are not much different where there is a negative influence significant towards RWA. These results are consistent with the findings of Khan et al. (2017) which states that the aggressiveness of risk-taking behavior in response to increased liquidity tends to decrease during the global financial crisis period. This also supports the statement of Ivashina and Scharfstein (2010) which states that banks reduce new loans to large debtors during the peak of the crisis. This trend was partly due to the fact that risk taking behavior from banks was highlighted as one of the main factors causing the crisis. Therefore, the supervisory process for banks was also tighter during this period.

4. CONCLUSION

The result of this study shows that the problem of low profitability in European banks may trigger banks to take bigger risks to achieve higher profits. These results indicate that Europe that have more advanced financial systems, banks with higher levels of funding liquidity tend to have more aggressive risk-taking behavior in the future. Bank risk-taking behavior in response to increased liquidity was generally lower during the global financial crisis period. This could be due to increased risk aversion and a tighter monitoring process during this period.

REFERENCES

Acharya, V., & Mora, N., 2015. A crisis of banks as liquidity providers. Journal of Finance 70, 1-43.

Adrian, T., Shin, H.S., 2010. Liquidity and leverage. Journal of Financial Intermediation 19, 418-437.

Agenor, P.R., & Aynaoui, K.E., 2010. Excess liquidity, bank pricing rules, and monetary policy. Journal of Banking and Finance 34, 923-933.

Anginer, D., Demirguc-Kunt, A., Zhu, M., 2014. How does deposit insurance affect bank risk? Evidence from the recent crisis. Journal of Banking and Finance 48, 312-321.

Baltagi, B.H. (2007). Econometric analysis of panel data. New York: John Wiley and Sons.

Bougatef, K., Mgadmi, N., 2016. The impact of prudential regulation on bank capital and risk-taking: The case of MENA countries. The Spanish Review of Financial Economics 14, 51-56.

Chen, M.H., Jeon, B.N., Wang, R., &Dahir, Mahat, Razak, Bany-Ariffin. 2018. Capital, funding liquidity, and bank lending in emerging economies: An application of the LSDVC approach. Borsa Istanbul Review xx (2018) 1e10.

Drakos, A.A., Kouretas, G.P., & Tsoumas, C. 2016. Ownership, interest rates, and bank risk-taking in Central and Eastern European countries. International Review of Financial Analysis, 45, 308-319.

Drehmann, M., Nikolaou, K. 2013. Funding liquidity risk: definition and measurement. Journal of Banking and Finance 37, 2173-2182.

International Monetary Fund (IMF), 2008. Global Financial Stability Report, April. International Monetary Fund, Washington.

International Monetary Fund (IMF). (2008). Global financial stability report: Containing systemic risks and restoring financial soundness. Washington DC: International Monetary Fund.

International Monetary Fund (IMF). (2017). Global financial stability report: Getting the policy mix right. Washington DC: International Monetary Fund.

Ioannidou, V.P., Penas, M.F., 2010. Deposit insurance and bank risk-taking: Evidence from internal loan ratings. Journal of Financial Intermediation 19 (1), 95-115.

Ivashina, V., Scharfstein, D., 2010. Bank lending during the financial crisis of 2008. Journal of Financial Economics 97, 319-338.

Jensen, M.C., 1986. Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review, 323-329

Keeley, M.C., 1990. Deposit insurance, risk, and market power in banking. American Economic Review 80, 1183-1200.

Khan, M.S., Scheule, H., Wu., E., 2017. Funding liquidity and bank risk taking. Journal of Banking and Finance 82, 203-216.

Laeven, L., Levine, R., 2009. Bank governance, regulation, and risk taking. Journal of Financial Economics 93, 259-275.

Nguyen, V.H.T., Boateng, A., 2015. An analysis of involuntary excess reserves, monetary policy, and risk-taking behaviour of Chinese Banks 2015. International Review of Financial Analysis 37, 63-72.

Pontes, G., Murta, F., 2012. The determinants of the bank's excess liquidity and the credit crisis: The case of Cape Verde.

Smaouia, Mimounia, Miniaouib, Temimia. 2020. Funding liquidity risk and banks' risk-taking: Evidence from Islamic and conventional banks. Pacific-Basin Finance Journal 64 (2020) 101436.

Wibowo, B. (2013). Ekonometrika keuangan: Dasar-dasar pemodelan riset keuangan. Jakarta: Lembaga Managemen Fakultas Ekonomi Universitas Indonesia.