

Liquidity Risk and Return to Islamic Interbank Money Market Development

Mochamad Malik Akbar Rohandi

Faculty of Economics and Business – Management, Universitas Islam Bandung (UNISBA)

moch.malik@gmail.com

ABSTRACT

The purpose of this study is to determine the effect of risk management of Islamic banking liquidity, determine the factors that cause the relationship of influence between the management of liquidity risk and IIMM Return, and knowing the prospects of risk management issues of Islamic bank liquidity concern to the development of IIMM. This research use descriptive and ARCH and GARCH Method. The results show the variant of EGARCH (1,1) as the best model with R^2 1.44%. The Factors affect to IIMM are FDR, STM and Return. This research contributes to sharia banking in determining liquidity risk management where sharia IIMM can develop when sharia banking is in a condition of shortage liquidity, volatility sharia IIMM have quite stable condition.

Keywords: ARCH and GARCH, IIMM Volume, Liquidity Risk, Return, Risk of STM and FDR

ABSTRAK

Tujuan dari penelitian ini adalah untuk mengetahui pengaruh manajemen risiko likuiditas perbankan syariah, menentukan faktor-faktor yang menyebabkan hubungan pengaruh antara manajemen risiko likuiditas dan *IIMM Return*, dan mengetahui prospek masalah manajemen risiko dari kekhawatiran likuiditas bank syariah untuk pengembangan IIMM. Penelitian ini menggunakan metode deskriptif dan ARCH dan GARCH. Hasilnya menunjukkan varian EGARCH (1,1) sebagai model terbaik dengan R^2 1,44%. Faktor-faktor yang mempengaruhi IIMM adalah FDR, STM dan *Return*. Penelitian ini memberikan kontribusi bagi perbankan syariah dalam menentukan manajemen risiko likuiditas di mana IIMM syariah dapat berkembang ketika perbankan syariah berada dalam kondisi kekurangan likuiditas, volatilitas IIMM syariah memiliki kondisi yang cukup stabil

Kata Kunci: ARCH dan GARCH, Volume IIMM, Risiko Likuiditas, *Return*, Risiko STM dan FDR

INTRODUCTION

Background

Low interest in Islamic bank in conducting liquidity risk management in the Islamic Interbank Money Market (IIMM) led to sluggish development of IIMM which is still represented by two instruments, first Certificate of Mudharabah Interbank Investment and Certificate of Commodity Trading based on Islamic principles. IIMM can lead to potential liquidity risk because one of the keys that must be done in order to remain liquid banking has access to the money market to obtain any necessary funds (Riyadi, 2006). High proportion of liquidity management of Islamic banking at the central bank instruments led the development of the Islamic financial market became constrained and less than optimal (Alam, 2012).

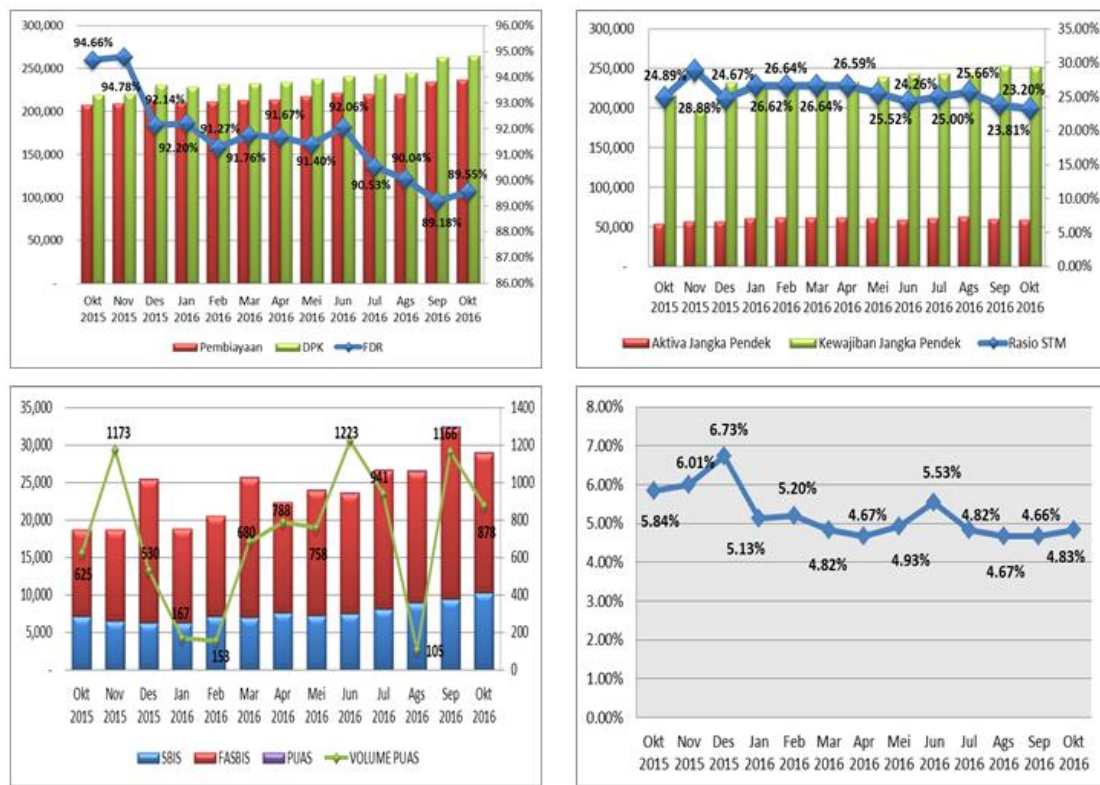


Figure 1. Outstanding FASBIS, SBIS, IIMM and Volume IIMM, Financing, DPK, FDR ratio, STM ratio and Return of IIMM
 (Source: Islamic Bank Statistic data and OJK, Data Processing Result)

It shows *Outstanding* FASBIS, SBIS, IIMM and Volume IIMM, Financing, Depositor Fund (DPK), Finance to Deposits Ratio (FDR), Short Term Mismatch (STM) ratio and IIMM Return. The volume growth in Islamic interbank money market transactions is not significant when compared with developments placement instrument in central bank liquidity management, it shows low interest in conducting banking transactions on the interbank money market liquidity which may create risk. The picture shows that there is a mismatch in term of assets that have an average of more than two years and liabilities with an average term of less than two years.

Problem Identification

Research questions for this study: 1. Why liquidity management in Islamic bank influence the development of IIMM? 2. What factors are affecting the development of IIMM? 3. How does the prospect of liquidity risk management issues to the development of Islamic banking IIMM?

LITERATURE REVIEW

High of Finance to Deposits Ratio (FDR) describe the high level of liquidity risk faced by Islamic bank industry (Wahyudi, et al., 2013). Liquidity risk occurs when the bank unable to match the timeframe of the asset and its liability (Van Greuning and Iqbal, 2011).

According to Muhammad (2002), the placement of idle funds in Islamic banking on monetary instrument of IIMM is still a subjective decision and based on maximizing profit motive. Widyastuti and Anwar (2009) concluded that the placement of idle funds in Islamic banking should be placed on SWBI instrument due to having a more minimal risk and impact compared with IIMM. Halim Alamsyah as Deputy Governor of Bank Indonesia stated that the high portion in central bank instrument caused the development of Islamic interbank money market became constrained and not optimal (Alamsyah, 2012).

METHOD

IIMM has an unstable tendency or volatile and the implication high volatile data is that the variant of the error is not constant or heteroskedasticity (Juanda and Junaidi, 2012). Models that can utilize heteroscedasticity in error appropriately result in more efficient estimators known as (ARCH) and (GARCH) (Nachrowi and Usman, 2006).

This research used descriptive analysis and ARCH and GARCH models analysis. The data used secondary data in the form of monthly time series data obtained from the Indonesian Banking Statistics (IBS) and Islamic Banking Statistics of Bank Indonesia, starting from October 2010 until October 2016.

Data Variable for this research was the Volume of Islamic interbank money market (VIIMM), STM ratio (STM), FDR ratio (FDR), Level of Return IIMM transaction (Return).

Regression models ARCH and GARCH equation in this study is

$$VIIMMt Stmt = \beta_0 + \beta_1 + \beta_2 + \beta_3 FDRt Return + et$$

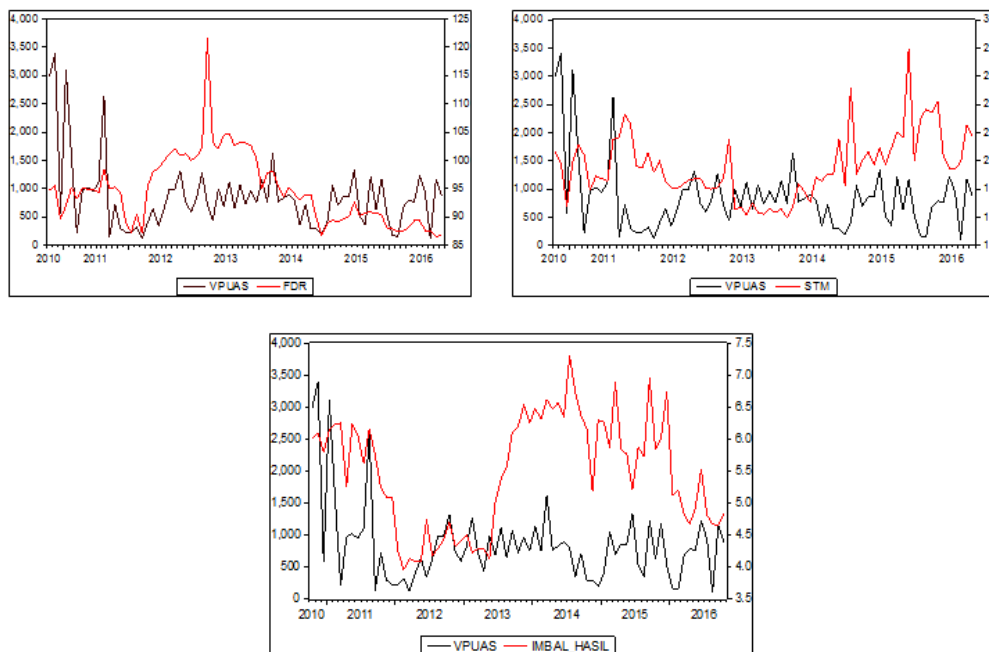


Figure 2. Indonesia Islamic Banking Data Statistics and Financial Service Authority,

(Source: Data Processing Result)

It shows FDR in period October 2010 - October 2016 was in the range of 86.43% - 121.50%, it indicates the ability of Islamic banks in managing liquidity risk is ranked inadequate and weak. The Islamic banks have great potential in the face of liquidity risk. In January 2014 - October 2016 the average ratio FDR Islamic banking is below 100%, it shows during the period of Islamic banking have average excess liquidity.

The equations model analysis of liquidity risk and Return to the development of Islamic interbank money market with the dependent variable is VIIMM and the independent variable STM, FDR, and Return are as follows:

$$VIIMM = - 43.27191 \text{ STM} + 13.17553 \text{ FDR} + 69.31867 \text{ Return}$$

$$\text{Equations Var } (e_t) : \sigma^2_t = 2.002558 - 0.194907 \left| \frac{e_{t-1}}{\sigma_{t-1}} \right| + 0.141077 \left(\frac{e_{t-1}}{\sigma_{t-1}} \right) + 0.843678 h \sigma^2_{t-1}$$

Table 1. Selection of the Best Model

Model	Significant $\alpha=5\%$			Log Likelihood	AIC	SIC
	STM	FDR	Return			
ARCH (1)	X	X	√	-561.7680	15.52789	15.68477
GARCH(1,1)	X	√	√	-534.9584	14.82078	15.00904
ARCH -M (1,1)	X	X	√	-554.0008	15.34249	15.53075
TARCH (1,1)	√	√	√	-554.6402	15.38740	15.60704
EGARCH(1,1)	√	√	√	-545.7613	15.14414	15.36378

Evaluate of the best Model

Model	Evaluation test			
	ARCH - LM	Histogram Normality Test	Correlogram Q Statistic	Unit Root Test
ARCH (1)	√	X	√	√
GARCH(1,1)	√	√	X	√
ARCH -M (1,1)	√	X	√	√
TARCH (1,1)	√	X	X	√
EGARCH(1,1)	√	√	√	√

(Source: Data Processing Result)

From the estimation and simulation and evaluation of the ARCH and GARCH models as well as the variants of the ARCH and GARCH models used, it can be concluded that the research used the EGARCH model (1.1) which is assumed to be the best model, with the following outputs:

Table 2. Relationship of IIMM, FDR, STM and Return

VIIMM Model Estimated			
Dependent Variable : VIIMM			
Independent Variable	Coefficient	Std. Error	t-test
STM	-43.27191	12.05145	0.0003
FDR	13.17553	2.593307	0.0000
Return	69.31867	28.87978	0.0164
Variance Equation			
C	2.002558	0.607621	0.0010
ABS (RESID (-1)/@SQRT (GARCH (-1))	-0.194907	0.282325	0.4900
RESID (-1)/@SQRT (GARCH (-1))	0.141077	0.076487	0.0651
LOG (GARCH (-1))	0.843678	0.063990	0.0000
Diagnostic Analysis	Value		
R-squared	0.014424		

(Source: Data Processing Result)

The output generated from the EGARCH model (1,1) in the table above shows the model with the independent variables STM, FDR and Return are already significant while the residual variance free variable is not significant, but the resulting model is stationary. Based on the estimation of the EGARCH model (1.1) above, the coefficient for each variable is interpreted as follows:

Statistically at the 5% probability the STM, FDR and Return independent variables significantly influence the VPUAS dependent variable. Every increase in the STM free variable by 1% will cause a decrease in the VPUAS variable by 43.27191 billion rupiah. Every increase in the FDR-free variable of 1% will cause an increase in the VPUAS variable of 13,17553 billion rupiah. Every increase in the free return variable by 1% will cause an increase in the VPUAS variable of 69.31867 billion rupiah.

Statistically at the critical point at $\alpha = 5\%$ it is known that the sign effect shown by the variable (RESID (-1) / @ SQRT (GARCH (-1)) is not significant so it can be concluded that there is no difference in effect between positive and negative shocks on period t to the current range, and that the magnitude effect shown by the ABS variable (RESID (-1) / @ SQRT (GARCH (-1)) is not significant) so it can be concluded that volatility in the t-1 period does not affect the current range or in other words the above model does not show any asymmetric effect.

RESULTS AND DISCUSSION

Liquidity risk management in Islamic banking has a significant influence on the development of Islamic interbank money market. Liquidity risk management policy at the Islamic banks have excess liquidity will lead the development of Islamic interbank money market decreased, but when the Islamic banking experience a shortage of liquidity policy of management on these conditions will lead to the development of the Islamic interbank money market increased. Besides that, it is also the development of Islamic interbank money market is significantly affected by short-term liquidity risk policy.

The factors can impact the relationship between liquidity management and Return to the development of IIMM are STM, FDR and Return. The STM ratio has a significant impact, in every increase of 1% it will cause transaction volume IIMM decreased approximately 43.27 billion rupiah. The FDR ratio has significant impact, in every increase of 1% will be followed by an increase in volume of IIMM approximately 13.17 billion rupiah. While Returns and IIMM transaction volume has seen a unidirectional relationship with coefficient is positive, in every increase of 1% in the ratio of Return IIMM will be followed by an increase in the volume of transactions that occur in IIMM approximately 69.32 billion.

The independent variables like STM, FDR and Returns have significant influence on the development of IIMM with the indicated amount by R^2 at 1.44% and the remaining 98.56% influenced by other variables. It shows the independent variables used get small influence on the development of IIMM.

The prospect of Islamic liquidity risk management issues stems from liquidity risk management policy which IIMM may develop in the conditions of lack of liquidity or liquidity shortage. Besides that, the volatility of IIMM volume was not affected by the volatility of the previous period. It is not shown the differences shocks effect between positive and negative in t period to current, it indicates the actual IIMM in fairly stable conditions.

CONCLUSION

Short term liquidity risk policy can impact the development of Islamic interbank money market significantly. Liquidity risk management in Islamic Banking has a significant influence on the development of the IIMM. The liquidity risk management policy when sharia banks experience excess liquidity or what is referred to as excess liquidity will cause the development of sharia interbank money markets to decline and vice versa.

Factors that cause an influence relationship between liquidity management and yields on the development of the Islamic interbank money market are the STM ratio, the FDR ratio and the Return. STM, FDR and Returns influence the development of IIMM as 1,44%. The STM rasio, FDR Rasio has a significant impact, in every increase of 1% in the ratio of Return IIMM will be followed by an increase in the volume of transactions.

Prospects for sharia liquidity risk management problems stem from liquidity risk management policies in sharia banks where sharia interbank money markets can develop when sharia banks are in a condition of shortage liquidity.

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