The Influence of Monetary Instrument toward Money Demand M2 under Dual Banking System in Indonesia Period 2015-2018

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Abstract: Money demand holds an important role in monetary policy's behaviour in overall economic activities. Moreover, Bank Indonesia use monetary instrument which transform to dual banking system. This research has purpose to analyze the influence of monetary instruments toward money demand M2 under dual banking system and to know the monetary instrument more stable and faster in influencing money demand M2 under dual banking system. The data used in this research was secondary data earned from Indonesia Banking Statistics (SPI), Sharia Banking Statistics (SPS), Indonesian Financial Statistic (SEKI) and Financial Service Authority (OJK). using the time series data from January 2015 till December 2018. In order to achieve the purpose, this research used *Vector Autoregression/Vector Error Correction Model.* The research concluded that the influence of monetary instruments toward M2 under dual banking system are significant. Based on VECM result, conclude that Islamic monetary instruments are more significant influenced than conventional one toward M2. based on IRF result, conventional monetary instrument more stable and faster than Islamic monetary instrument which FASBI and SRR more stable and faster than FASBIS and SRRISL in influencing money demand M2. But, SBIS is more stable and faster than SBI to influence Islamic M2 and increase economic growth.

1 INTRODUCTION

According to the law No. 10 1998 Indonesia has operating dual banking system. It is due to the fact that monetary policy has practiced dual system which monetary stability be the same purpose of them and become the most important targets. There are the different principle of taking profit between dual banking system, distribution of fund in conventional bank based on interest rates. On the contrary, Islamic bank did not based on interest rate for taking the profit.

In addition, the inflation would give the effect in reducing effectiveness monetary policy especially, for influencing money demand, money instability and purchasing power of money. Moreover, this decreasing, would effect to demand for holding money or saving money. Conceptually, the inflation volatility is the result one of the highest growth of money supply.

Whereas, Bank Indonesia as monetary authority, maintain the money stability by optimizing monetary operation in money market and strengthen the monetary policy by stabilizing monetary instrument in financial system. Commonly, there are the monetary instruments through conventional banking system such as Open Market Operation (OMO), discount rate and reserve requirement. While, Islamic banking system, bank Indonesia used reserve requirement (SRR), Open Market Operations and Standing Facilities.

The different concept between Islamic bank and conventional bank for getting the profits which influence the money demand M2 under dual banking system. Then, this paper will compare the monetary instruments in every bank.

Actually, those instruments are influenced by interest rate and interest rate negatively correlated to the money demand and income positively correlated against money demand. This describes that the influence of interest rate, because the Government conducts the monetary contraction, interest rate will be raised which cause increasing on monetary instruments such as SBI, FASBI and SRR. From here the Government wants to decrease money demand and money supply in the community. It will slow the economic growth.

The Islamic financial system operates PLS system in executing monetary operation. Islamic monetary instruments are not different as conventional monetary instrument, but Islamic financial system use SBIS and FASBIS which have several differences to SBI and FASBI. Hence, the researcher specifies the following research model:

$$Md = f \, (SRR, SBI, FASBI) \qquad (1)$$
$$MdISL = f \, (SRR, SBIS, FASBIS) \qquad (2)$$

The differences between the two models is opportunity cost variable in holding money for each model. Opportunity cost for conventional M2 model is the interest rate and for Islamic M2 model is the return sharia (Figure 1).

Discount rate and moral suasion is not discussed in this research. The researcher using instruments OMO (Open Market Operation) SRR, FASBI and FASBIS

2 LITERATURE REVIEW

Monetary instruments is Bank Indonesia instruments which have influenced to the operational target in a direct or indirect target. These instruments used by Bank Indonesia through monetary instruments to change profit-sharing ratio and the high currency value through SBI and other securities transaction (Daisy, 2010). There are other monetary instrument such as open market operation, reserve requirement, discount facility dan moral suasion.

From these several monetary instruments, Ascarya (2002) differ into three types: 1) According to operational target, divided into direct and indirect instrument, 2) According to orientation in financial market, divided into market oriented and non-market oriented, 3) According to discretion. Generally, the direct instrument is a non-market oriented and the discretion in central bank as monetary authority. While indirect instrument is a market oriented or a non-market oriented and discretion in central bank. different from the characteristics of the system of
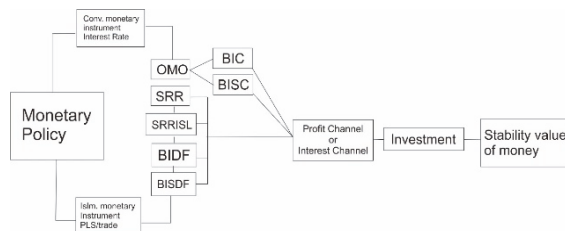

Figure 1: Theoretical Framework.

revenue sharing. Interest rates may be determined at any time by the banking authorities and its nominal movement can be seen by the public.

Meanwhile, Hasanah et.al (2008) explains that the characteristics of the system of interest is very

Thus, its movement can lead to speculative activities. In contrast, the nisbah is set and its value remains valid throughout the contract. Meanwhile, the returns will follow the actual business. In a profit-sharing system (sharia return), profits will be shared as well as the loss will also be shared. Therefore, profit-sharing system will ensure the fairness and neither party will be harmed. In Islamic banking, profit-sharing system can be shaped as wadha contract, musharaka, mudharaba.

Moreover, Ahmad Kaleem explains the demand for Islamic monetary instruments in case of dual banking system. It also demonstrates the validity and effectiveness of these instruments for monetary policy purposes. Apart from this Islamic bank is also not allowed to issue securities involving interest like long and short-term bonds, debentures and preference shares. Currently, Islamic banks on its liability side of their balance sheet are based on four main sources of funds. This includes shareholder's funds, current, saving and investment accounts.

3 RESEARCH METHOD

This study used quantitative and comparative research. Other side, this research used the time series data, then it would cause the data not stationer which show the failure in forecasting economy. This condition called by spurious correlation which cause to false regression. So, the problem solving is Vector Auto Regression (VAR)/Vector Error Correction Model (VECM).

Where in the VAR model all variables are treated as endogenous variables. Then the VAR equation model for conventional monetary instruments can be written as follows:

$$\begin{bmatrix} lnMd_t \\ lnSRR_t \\ lnSBI_t \\ lnFASBI_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} \end{bmatrix} + \begin{bmatrix} lnMd_{t-1} \\ lnSRR_{t-1} \\ lnSBI_{t-1} \\ lnFASBI_{t-1} \end{bmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \qquad (3)$$

Then, if the data are stationary at first difference and having one co-integration, the next process is performed using the error correction method. Then the VECM equation model for conventional monetary instruments can be written as follows:

$$\begin{bmatrix} \Delta lnMd_t \\ \Delta lnSRR_t \\ \Delta lnSBI_t \\ \Delta lnFASBI_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} \end{bmatrix} \begin{bmatrix} \Delta lnMd_{t-1} \\ \Delta lnSRR_{t-1} \\ \Delta lnSBI_{t-1} \\ \Delta lnFASBI_{t-1} \end{bmatrix} - \lambda \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \quad (4)$$

While, VAR equation model for Islamic monetary instruments can be written as follows:

$$\begin{bmatrix} lnMdISL_t \\ lnSRR_t \\ lnSBIS_t \\ lnFASBIS_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} \end{bmatrix} \begin{bmatrix} lnMdISL_{t-1} \\ lnSRR_{t-1} \\ lnSBIS_{t-1} \\ lnFASBIS_t \end{bmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \quad (5)$$

Because the data is stationary at frist difference between variables and there are co-integration among VAR models and the test will continue to VECM models. VECM equation model for Islamic monetary instrument can be written as follows:

$$\begin{bmatrix} \Delta lnMdISL_t \\ \Delta lnSRR_t \\ \Delta lnSBIS_t \\ \Delta lnFASBIS_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} \end{bmatrix} \begin{bmatrix} \Delta lnMdISL_{t-1} \\ \Delta lnSRR_{t-1} \\ \Delta lnSBIS_{t-1} \\ \Delta lnFASBIS_{t-1} \end{bmatrix} - \lambda \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \quad (6)$$

4 RESULT DISCUSSION

4.1 Unit Root Test and Co-integration Test

This method used to perform stationary test data using ADF test by 5% significance level. On the contrary, when the probability t-statistic higher than 5% significance level, it would conclude non stationary data. Roots unit test is done at the level until the first difference level. The all variables are not supposed to be stationary at the level. Therefore, unit root test needs to be continued on the first difference level (Table 1).

Table 1: Summary of Root Test.

Test	Augmented Dickey-Fuller				
VARIABLES	Level		first difference		Note
	ADF	Prob	ADF	Prob	
M2	-0.347276	0.9093	-7.746453	**0.0000**	Stationary
M2ISL	-0.442398	0.892	-3.0059	**0.0427**	Stationary
SBI	-1.59791	0.4755	-4.251412	**0.0015**	Stationary
SBIS	-1.577392	0.4859	-5.0871	**0.0001**	Stationary
FASBI	-2.003262	0.2844	-9.429407	**0.0000**	Stationary
FASBIS	-2.619637	0.0962	-6.557681	**0.0000**	Stationary
SRR	-1.32294	0.6113	-8.280907	**0.0000**	Stationary
SRRISL	-1.13741	0.6932	-7.922341	**0.0000**	Stationary

From information above, it can be concluded that all variables have the same order of integration or it is called as co-integration. Co-integration among variables show based on trace method, see from a trace-statistic value greater than the critical value which indicated there are co-integration on the model.

Based on co-integration test, shows that there is at least one co-integration on a 5% significance level. Conventional M2 and Islamic M2 both have one co-integration (Table 2).

Table 2: Co-integration Test.

M2ISL			M2		
Hypothesized No. Of CE(s)	Trace Statistic	Prob.**	Hypothesized No. Of CE(s)	Trace Statistic	Prob.**
None *	**68.73692**	**0.0002**	**None ***	**49.28524**	**0.0365**
At most 1	29.35191	0.0562	At most 1	9.415262	0.9876
At most 2	10.55512	0.2404	At most 2	3.507152	0.9392
At most 3	1.308699	0.2526	At most 3	0.080677	0.7764

4.2 VECM Estimation

After the co-integration test, it is known that M2 model and M2ISL model have the co-integration, then it can be extended to the VECM phase. At this step, the result of VECM will be used to determine the long-term and short-term relationships between variables of research. The variable is called significant in influencing other variables when the value of t-statistics higher than t-table on rank 1.96 (t statistic > 1.96) (Table 3).

Table 3: Summary of VECM Estimation.

Variables	Coefficient	T-Statistic	Variables	Coefficient	T-Statistic
LONG TERM			**LONG TERM**		
SBI	-0.067994	**-2.40326**	SBIS	0.072545	**2.77159**
FASBI	1.003219	**4.50062**	FASBIS	0.079495	**2.92258**
SRR	-1.442787	**-2.70387**	SRRISL	-0.637239	**-25.9177**
SHORT TERM			**SHORT TERM**		
CointEq1	-0.277016	-3.07945	CointEq1	-0.075989	-0.48727
D(M2(-1))	-0.418997	**-2.23523**	D(M2ISL(-1))	-0.399005	-1.88453
D(M2(-2))	-0.201427	-1.14298	D(M2ISL(-2))	-0.16707	-0.91693
D(SBI(-1))	0.001279	0.1116	D(SBIS(-1))	-0.092833	-1.43093
D(SBI(-2))	0.012795	1.18346	D(SBIS(-2))	0.083996	1.34172
D(FASBI(-1))	0.019478	1.63439	D(FASBIS(-1))	-0.019796	-0.74899
D(FASBI(-2))	-0.001664	-0.17272	D(FASBIS(-2))	-0.024069	-0.96362
D(SRR(-1))	-0.042317	-0.61071	D(SRRISL(-1))	-0.156775	-1.62165
D(SRR(-2))	0.070875	1.0195	D(SRRISL(-2))	-0.056821	-0.66523

Based on the VECM results, in the conventional model there is an error term amount 0.277016 and shows that the error need to be corrected by the model 27%. The adjustment required to reach the stability condition (1/0.277016) is 3 months. While, in Islamic model there are an error term amount 0.075989 and show that the error needs to correct by the model 7%. The adjustment required to reach the stability condition (1/0.075989) is 13 months. From this explanation, conclude that the Islamic model need more times than conventional.

While, money demand M2 conventional in the long term showed the significant correlation between variables. SBI had negatively correlated toward conventional M2 with coefficient -0.067994, which means increasing SBI by one per cent would trigger the decline to M2 by -0.067994 per cent. On the

contrary, SBIS had positive influence on Islamic M2 Islam with t coefficient of 0.072545, which means when SBIS increased by one per cent it will trigger an increase in Islamic M2 by 0.072545 per cent.

Moreover, FASBI had a significant impact of conventional M2 with the coefficient 1.003219, which means when FASBI increased by one per cent, it would trigger the increase of conventional M2 by 1.003219 per cent. While, FASBIS had positive correlated on Islamic M2 with coefficient of 0.079495, which means when FASBIS increased by one per cent it will trigger increase in Islamic M2 by 0.079495 per cent.

Whereas, SRR variable in conventional banking had negatively correlated toward conventional M2 with coefficient -1.442787 per cent, which means when SRR increased by one per cent, it would trigger a decline in conventional M2 by -1.442787 per cent. Moreover, SRRISL negatively correlated to Islamic M2 by coefficient -0.637239, which means when the level SRRISL increases by one per cent it will trigger a decrease on Islamic M2 of -0.637239 per cent.

4.3 Impluse Response Function

Impluse Response Function shows the conventional M2 responded to shocks from other variables. The shocks of SRR variables have positively responded by conventional M2 for overall of the forecast. In the third period, the shocks of SRR for one standard deviation led an increase of conventional M2 for 0.000983 standard deviations, but this is not permanent because the decline continued during the fourth period until the ten a period. Those responses began to stable from the tenth period to until the end of the forecast.

On the contrary, the shock of FASBI has negatively responded by conventional M2 for overall the forecast. Shocks of FASBI for one standard deviation will trigger a decline conventional M2 by -0.002273 standard deviations, but this is not permanent because it has increased in the fifth period until ninth period. The repons of conventional M2 began to stable in eleventh period which is indicated by the coefficient of -0.00108 standard deviations.

While, the shock of SBI has positively responded by conventional M2 for the overall forecast. On the fourth period, the shock of SBI for one standard deviation will trigger an increase the conventional M2 by 0.000451 standard deviation. Increasing of conventional M2 responce has occurred from the fifth period until the ninth period and getting stable in the fourteenth period and indicated by 0.000847 until the end of the forecast (Figure 2).
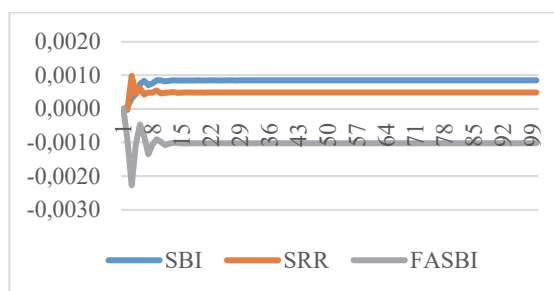

Figure 2: IRF of Conventional M2 Model.

Moreover, Impluse Response Function for Islamic model is Uneven. the second period until the end of forecast Islamic M2 has negatively responded to a shock from SRRISL variables. The shock of SRRISL for one standard deviation can lower Islamic M2 by -0.0018 standard deviation, but this did not happen continuously because Islamic M2 has positively responded in the next period. In the sixth period shocks of SRRISL for one standard deviation would an increase Islamic M2 by 0.0047 and will be stable in twentieth period.

Meanwhile, the Islamic M2 had negatively responded to shocks of FASBIS variable for the overall forecast. In the third period, the shock of FASBIS for one standard deviation led to decrease the Islamic M2 by -0.0047 standard deviation. But this is not permanent because it would increase until the eighth period. The response would be stable from the fifteenth period until the end of the forecast.

Moreover, Islamic M2 variable had positively responded to the shock of SBIS variable in the first period until the fourth period. The shock of SBIS for one standard deviation would trigger an increase in Islamic M2 to 0.0013 standard deviations. But this is not permanent because the next period Islamic M2 had negatively responded until the end of the forecast. The shock of SBIS in the fifth period for one standard deviation would trigger a reduce the Islamic M2 by -0.0004 standard deviations and would be stable in twelve period (Figure 3)
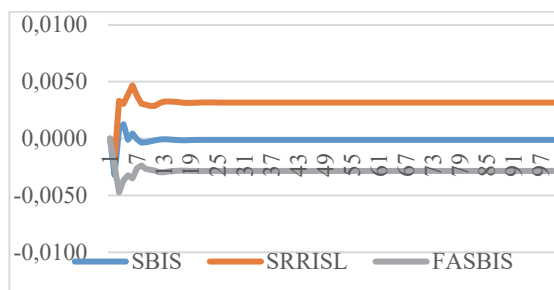

Figure 3: IRF of Islamic M2 Model.

4.4 Forecasting Error Variance Decomposition

The conventional M2 model on the first period was influenced by conventional M2 variable itself by 100 per cent. Meanwhile, the effect of variable conventional M2 decreased to 58.96 per cent in 100th period. The results of FEVD indicate the information that conventional M2 can be explained by variables SRR, FASBI and SBI by 0.00 per cent in the first period.

Furthermore, conventional M2 can be explained by the variable SRR by 4.92 per cent in 100th period. This show that SRR has the smallest influence and contribution to the conventional M2. Results of FEVD provides information that SBI had influenced by 14.11 per cent in the 100th period. While the influence of FASBI amounted 21.99 per cent in the 100th period. Meanwhile, FASBI has significant influence and contributing to the conventional M2 (Figure 4).
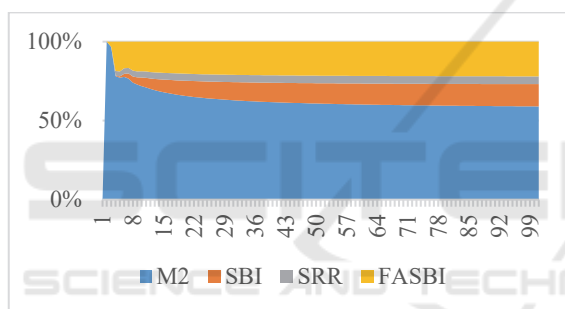

Figure 4: Forecasting Error Variance Decomposition of Conventional M2 Model.

Moreover, FEVD for Islamic M2 in the first period was affected by Islamic M2 itself by 100 per cent. However the influence of Islamic M2 decreased to 65.12 per cent in the 100th period. Furthermore, from results FEVD it can be seen that the information could be explained by the Islamic M2 such as SRRISL, FASBIS and SBIS with 0.00 per cent in the first period.

Furthermore, Islamic M2 can be explained by the variable SBIS with 0.27 per cent in the 100th period. In addition, the results of FEVD provide information that FASBIS influenced by 15.61 per cent during the 100th period. while SRRISL was influenced by 18.98 per cent in the 100th period. This indicates that the variable SRRISL has higher influence and contribution to the Islamic M2 (Figure 5).
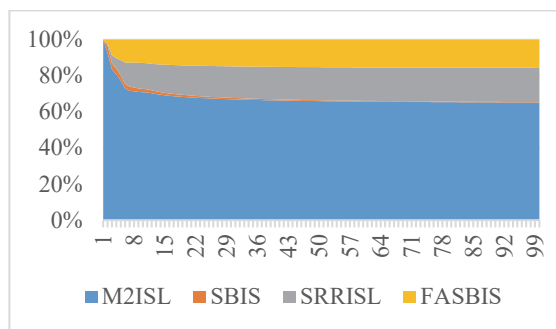

Figure 5: Forecasting Error Variance Decomposition of Islamic M2 Model.

5 CONCLUSSION

Some the goals of this research are as follow, first, to analyze empirically the influence of monetary instrument toward M2 under dual banking system. Second, to know which one monetary instrument more stable and quicker in influencing M2 under dual banking system

Empirically, the influence of monetary instruments toward M2 under dual banking system are significant. Based on VECM result, it can be concluded that Islamic monetary instruments has more significant influence than conventional one toward money demand M2. This reality is the result of the prohibition of interest rate in the Islamic financial system. On the contrary, the conventional financial system used interest rate channel and that cause the negative impact and economic instability.

Based on the IRF result, the conventional monetary instrument more stable and faster than Islamic monetary instrument which FASBI and SRR more stable and faster than FASBIS and SRRISL in influencing money demand M2. But, SBIS is more stable and faster than SBI. The shock of SBIS will be responded negatively by Islamic M2 in 12th period. While, SBI will responded positively by conventional M2 and stable in 14th period. SBI will increase inflation and shock while SBIS will decrease inflation but increase economic growth.

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