

**AN ANALYSIS OF FACTORS INFLUENCED TO INDONESIA  
SHARIAH STOCK INDEX (ISSI)  
Vector Error Correction Model (VECM) approach**

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**Abstract**

In Indonesia, money supply (M1) is related to the economic dynamics in either monetary market or goods market. This research about money supply (M1) in Indonesia aims at analyzing factors which influence money supply and to what extent the economic factors influence the money supply in Indonesia. The analysis method used in this research is Vector Autoregressive (VAR) with some variables such as money supply (M1), interest rate, Gross Domestic Product (GDP) from the 1st quarter of 2001 until 1st quarter of 2013. The data collecting method is in the form of data compilation from credible sources such as Bank of Indonesia (BI), Central Bureau of Statistic (CBS), and International Financial Statistic (IFS). To obtain adequate analysis result, several tests are taken such as unit root test, Granger causality test, and optimal lag. VAR analysis formulates the correlation among independent variables so it also sees the analysis of impulse response and matrix decomposition. The result of analysis shows that monetary policy is effective enough to influence the increase of economic growth when the condition is under employment as seen by the monetarists. The second period explains the fact about the contribution of national income (DPDB), in which the contribution of national income (DPDB) is 6.82 %, national income (DPDB) is 92.75 %, and interest rate (DR) is 0.4 %.

**Key words :** *Monetary policy, Impulse Response, Vector Decomposition, Syariah Compliant*

**1. Background of the problem**

Economic development in Indonesia experiences some dynamic turbulence due to the dynamic domestic market and global market. Global economic integration has triggered a strong interaction among world centers of economic growth and a new center for world economic growth in Asia Pacific and South East Asia including Indonesia. The economic integration among several countries has become more intensive, especially in monetary market which is very sensitive to every change in global economy. The following curve describes the development of money supply (M1) in some periods :

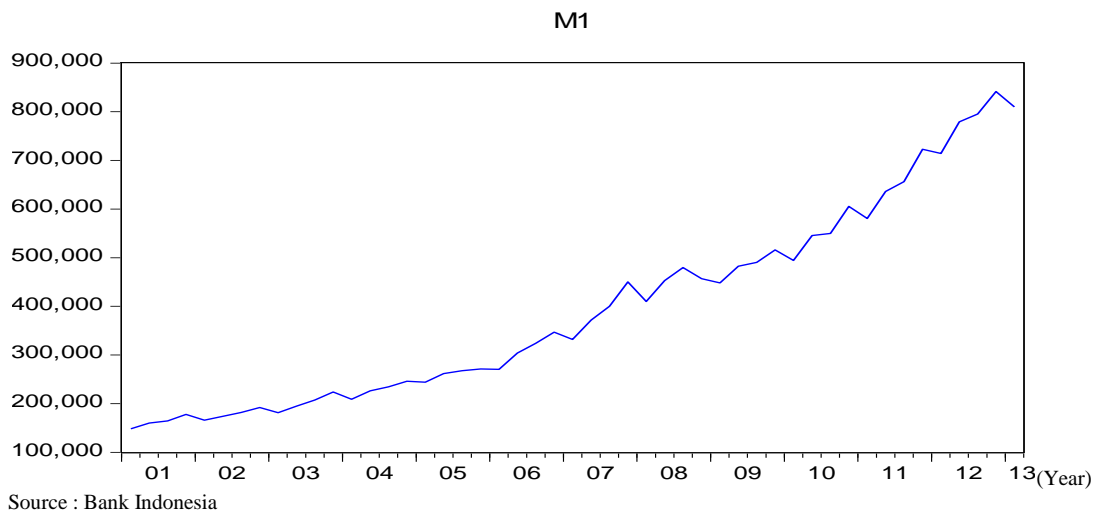


Figure 1 : The development of money supply in Indonesia from 2001 – 2013  
(trillion rupiah)

The figure above shows that the horizontal line shows years, from 2001 until 2013 in quarterly, while the vertical line shows money supply (M1). The quarterly data describe that money supply (M1) significantly and dynamically increases due to economic and non economic factors. The development of money supply (M1) is related to the development of money demand which is determined by fundantel factors of macro economy such as investment, consumption, export, import, and government's expenses. The increase of money supply (M1) indicates the increasing dynamics of economy in the real sector and financial sector. The increase of economic growth will support the increase of money supply (M1) and money demand. In return, the increase of money supply will also support the increase of economic growth. The fluctuation of global economy and the escalating price of world oil will influence the moving money supplythrough goods market and monetary market as one of the alternatives of portfolio investment in monetary market. This research aims at analyzing factors which influence money supply and on the other hand to find out the influence of money supply (M1) to other macro economic variables.

## 2. The theory of Money Supply

The theory that explains about money supply is quantity theory which originates from the classic's point of view. This theory is called Irving Fisher's theory and it has an equation formula as follows:

$$MV = PT$$

M = Money supply

V = Velocity of money

P = Price

T = Trade

The equation shows that the left side is equal with the right side. The left side is the monetary sector where the dynamics of monetary sector is determined by the central bank's policy in changing the money supply and the people's behavior in transaction using money that influences the velocity of money. Then, on the right side is the real sector which is determined by economic activities through trade transaction. When the economic condition is under unemployment, the implication is that the increase of money supply through expansive

monetary policy will support the increase of economic real sectors. However, in full employment economic condition, the implication is the increase of money supply will support inflation.

Theories on money supply after classical monetary theories have been developed by some experts, among others are Alfred Marshall and Pigou whose theory is popularly known as Cambridge Theory. In their theory, Marshall and Pigou state that the primary aspect of money is as medium of exchange. This contribution also includes people's behavior in using money (money demand) which is flexible and dynamic. This is contrary to Fisher's view which states that one's money demand is fixed.

Another theory which is also significant to develop the theory of money supply is Keynes' theory which adds an individual's aspect of motive in holding money. Keynes views money not only as a medium of exchange but also as store of value, so people have three motives namely transaction motive, precautionary motive, and speculation motive. Transaction and precautionary motives are determined by the level of income and they correlate positively, while speculation motive is determined by the interest rate. Keynes' thought is the development of Cambridge group's thought which states that people are faced with investment alternatives. Among the few investments are in the form of money and wealth such as securities, land, gold, etc.

In its development, money evolves in accordance with the demand of economic needs. The format and definition of economy develop, which is known as money in a narrow sense (M1), which is the amount of currency and demands deposit in the society that are distinguished from money in a broad sense (M2), which consists of M1 + time deposit and people's saving deposit. Recently, a transaction phenomenon using bank account as the medium occurred and it is known as electronic money (E-Money). People's need of economic transaction tends to increase and their desire to practically and efficiently use transaction media triggers many innovations in media, procedure, and payment mechanism.

The study and research on money supply have been conducted by some experts such as Sargent, Wallace (1973), Thornton (1983), Vitaliano (1984), Kliman (1995), Dumairy (1986), Soelistyo (2003) and Yuliadi (2005). Based on the analysis findings done by Domac and Elbirt (1998), money supply (M1) and exchange rate are the main factors that cause inflation. Specifically, an increase of 1% in money supply (M1) will boost inflation of 0.41%, and 1% of exchange rate depression will decrease inflation to 0.25%.

### **3. Analysis Method**

#### *3.1. Unit roots test*

To obtain adequate analysis result, problems related to stationary data should be solved using unit roots test. Fluctuation analysis of rupiah exchange rate against US dollar using VAR approach requires stationary data of time series. The concept which is applied to test stationary data of time series is unit roots test using Augmented Dickey-Fuller test (ADF) method. When time series data are not stationary, it means that those data have unit roots problem, which results on spurious data and invalid analysis results. To detect unit roots problem, the value of t-statistics as the result of regression can be compared with the value of Augmented Dickey Fuller (ADF). The equity model is formulated in the following:

$$\Delta M_t = a_1 + a_2 T + \Delta M_{t-1} + \alpha_i \Delta M_{t-1} + e_t$$

Where  $\Delta M_{t-1} = (\Delta M_{t-1} - \Delta M_{t-2})$ , and so on,  $m =$  length of time-lag based on  $i = 1..m$ . Null hypothesis stays  $\delta = 0$  or  $\rho = 1$ . The t-statistics value of ADF is the same as the t-statistics value of DF. Unit roots test can be done using Phillips-Perron test model. Data are stationary when the statistics value of ADF is more than the table value with critical value of 5% or 10%.

### 3.2. Granger Causality test

The fluctuation analysis of rupiah exchange rate against US dollar considers the influence among macroeconomy variables such as foreign exchange reserves, exchange rate, interest rate, inflation, and GDP. Granger causality test is used to find out if there is any causality among the variables. There are some possibilities of Granger causality test such as one way causality, two ways causality, and no causality among the variables.

### 3.3. Analysis of Vector Autoregressive (VAR)

Vector Autoregressive (VAR) analysis is an analysis model of dynamic economy that includes change of time-lag in the variables. The dynamic behaviors among the observed variables of Vector Autoregressive analysis will be explained further through property functions namely Impulse Response function and Variance Decomposition function.

Vector Autoregression analysis model can also be implemented to expect and to project the amount of a variable. So, in seeing the market phenomena in which exchange rate fluctuates significantly, the value of rupiah in certain periods can be identified. The model of Indonesian macro economy represents the economic model of a small country, so Vector Autoregressive Analysis considers that the model which is estimated in a certain condition can be used to predict different time condition and policy. Vector Autoregressive Analysis can also include an element of shock in the analyzed model as well as see the long term response based on the historical data. The research about exchange rate fluctuation is very sensitive to economic shock which comes from either domestic or foreign market. The sensitivity of monetary market is highly influenced by economic factors and institutions including the government's policy and the stability of national political security. Vector Autoregressive is one of the analysis tools which not only functions to see the causal correlation among variables, but also to see to what extent the influence of economic shock towards exchange rate stability. The dynamic values among the observed variables to see the influence of shock at Vector Autoregressive Analysis will be explained further through Impulse Response Function and Variance Decomposition.

## 4. The research results and discussion

This research analyzes the money supply in Indonesia from the 1st quarter in 2001 until the 1st quarter of 2013 by including research variables which consist of :

DPDB = National income

DM1 = Money supply (M1)

DR = Deposit interest rate

The first step in researching the exchange fluctuation is by seeing the character of the data, whether they are stationary or not. This research processes data using Eviews program, and to find out the stationary data, unit roots test is done through Augmented Dickey Fuller test on some variables consisting of national income (DPDB), money supply (DM1), and interest rate (DR). The result of the test shows that DPDB, interest rate, and money supply (DM1) are not stationary at their level. To get stationary data, first difference and second difference tests are conducted. The result shows that interest rate, DPDB, and DM1 are stationary at second difference.

The next step is determining optimal lag which is determined by final prediction error (FPE), Akaike information criterion (AIC), Schwarz criterion (SC) and Hannan-Quinn (HQ). The data processing using Eviews program shows the following result:

VAR Lag Order Selection Criteria  
 Endogenous variables: DM1 DPDB DR  
 Exogenous variables: C  
 Date: 02/23/15 Time: 22:29  
 Sample: 2001Q1 2013Q1  
 Included observations: 43

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-941.8601	NA	2.45e+15	43.94698	44.06986	43.99229
1	-872.7603	125.3439	1.50e+14	41.15164	41.64314	41.33289
2	-813.8832	98.58486	1.48e+13	38.83178	39.69190	39.14896
3	-795.4179	28.34213*	9.71e+12*	38.39153*	39.62027*	38.84465*
4	-789.8551	7.761996	1.18e+13	38.55140	40.14877	39.14046

\* indicates lag order selected by the criterion  
 LR: sequential modified LR test statistic (each test at 5% level)  
 FPE: Final prediction error  
 AIC: Akaike information criterion  
 SC: Schwarz information criterion  
 HQ: Hannan-Quinn information criterion

The data processing above shows that at lag 3, the value of final prediction error (FPE), value Akaike information criterion (AIC), Schwarz criterion (SC) and Hannan-Quinn (HQ) shows an asterisk (\*), which means that optimal lag occurs at lag 3. It means the influence of variable change includes the change until lag 3.

#### 4.2. Granger Causality Test

VAR analysis explains the influence among independent variables in the research uncluding the dynamic influence in some previous periods. Through Granger causality test, the causality of the research variables can be known. Granger causality test also functions to find out the correlation of one variable with other variables. The result of Granger causality test is shown in the table below:

Pairwise Granger Causality Tests  
 Date: 02/23/15 Time: 22:30  
 Sample: 2001Q1 2013Q1  
 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DPDB does not Granger Cause DM1	45	18.5021	2.E-06
DM1 does not Granger Cause DPDB		26.1871	5.E-08
DR does not Granger Cause DM1	45	18.5849	2.E-06
DM1 does not Granger Cause DR		10.7193	0.0002
DR does not Granger Cause DPDB	45	60.7681	8.E-13
DPDB does not Granger Cause DR		29.2708	1.E-08

The result of Granger causality test above shows that DPDB influences money supply, and in return money supply (DM1) influences DPDB. This economic phenomenon is in line with the view of the monetarists that states that money supply (DM1) can support economic growth when the condition is under employment, and it will cause inflation when the condition is full employment. On the other hand, economic growth will also support the increase of money

supply which is in line with the theory of monetary economy that states that the increase of economic growth triggers the increase of liquidity needs to support economic transaction, so that money supply (DM1) will also increase. Granger Causality test also states that interest rate (DR) influences money supply (DM1) and in return, money supply (DM1) influences the interest rate (DR). This monetary phenomenon can be explained through IS-LM analysis in which the increase of money supply (DM1) is indicated by the movement of LM curve to the bottom right so that it will cause the decrease of interest rate (DR). On the contrary, the change of interest rate will influence DM1 through expansive or contractive monetary policy instrument that can influence DM1 in society. Interest rate (DR) influences DPDB, and in return, DPDB also influences interest rate (DR).

#### 4.3. Vector Autoregressive (VAR) Analysis

VAR analysis is done to get information about the correlation among the research variables at several time lags before. The following chart shows the result of VAR analysis using Eviews program :

Vector Autoregression Estimates

Date: 02/23/15 Time: 23:22

Sample (adjusted): 2002Q2 2013Q1

Included observations: 44 after adjustments

Standard errors in ( ) & t-statistics in [ ]

	DM1	DPDB	DR
DM1(-1)	0.339648 (0.17161) [ 1.97913]	-0.009744 (0.03243) [-0.30044]	-6.63E-07 (6.7E-07) [-0.98764]
DM1(-2)	-0.328507 (0.17155) [-1.91488]	0.036910 (0.03242) [ 1.13853]	-3.77E-07 (6.7E-07) [-0.56225]
DM1(-3)	0.162954 (0.17463) [ 0.93313]	-0.006593 (0.03300) [-0.19980]	-1.53E-06 (6.8E-07) [-2.24469]
DPDB(-1)	1.346585 (0.75654) [ 1.77993]	0.712240 (0.14297) [ 4.98189]	1.04E-05 (3.0E-06) [ 3.52108]
DPDB(-2)	-0.844962 (0.35233) [-2.39823]	-0.987312 (0.06658) [-14.8288]	2.81E-07 (1.4E-06) [ 0.20365]
DPDB(-3)	0.914089 (0.78944) [ 1.15789]	0.641204 (0.14918) [ 4.29807]	8.64E-06 (3.1E-06) [ 2.79828]
DR(-1)	38735.31 (38656.1) [ 1.00205]	-3817.332 (7305.00) [-0.52256]	0.876399 (0.15120) [ 5.79633]
DR(-2)	-36246.91 (50822.3) [-0.71321]	13742.00 (9604.09) [ 1.43085]	-0.391885 (0.19879) [-1.97139]

DR(-3)	46716.13 (39475.0) [ 1.18343]	-461.8165 (7459.75) [-0.06191]	0.335132 (0.15440) [ 2.17051]
C	-7062.231 (12464.6) [-0.56658]	6026.527 (2355.48) [ 2.55851]	-0.126190 (0.04875) [-2.58831]
R-squared	0.773591	0.966673	0.934007
Adj. R-squared	0.713659	0.957851	0.916538
Sum sq. resids	7.27E+09	2.59E+08	0.111156
S.E. equation	14618.26	2762.469	0.057178
F-statistic	12.90785	109.5773	53.46744
Log likelihood	-478.7222	-405.4118	69.14900
Akaike AIC	22.21465	18.88235	-2.688591
Schwarz SC	22.62014	19.28785	-2.283093
Mean dependent	29722.80	13835.59	0.280000
S.D. dependent	27318.33	13455.65	0.197917
Determinant resid covariance (dof adj.)		4.84E+12	
Determinant resid covariance		2.23E+12	
Log likelihood		-812.8368	
Akaike information criterion		38.31076	
Schwarz criterion		39.52726	

The result above explains that the estimated value of the correlation among the variables consists of national income (DPDB), money supply (DM1), and interest rate (DR). The value above shows the coefficient value, while the value in brackets shows the standard value of error, and the value in [ ] shows the t-statistic value. Based on VAR analysis, VAR model is formulated with the following result:

Estimation Proc:

LS 1 3 DM1 DPDB DR @ C

VAR Model:

$$DM1 = C(1,1)*DM1(-1) + C(1,2)*DM1(-2) + C(1,3)*DM1(-3) + C(1,4)*DPDB(-1) + C(1,5)*DPDB(-2) + C(1,6)*DPDB(-3) + C(1,7)*DR(-1) + C(1,8)*DR(-2) + C(1,9)*DR(-3) + C(1,10)$$

$$DPDB = C(2,1)*DM1(-1) + C(2,2)*DM1(-2) + C(2,3)*DM1(-3) + C(2,4)*DPDB(-1) + C(2,5)*DPDB(-2) + C(2,6)*DPDB(-3) + C(2,7)*DR(-1) + C(2,8)*DR(-2) + C(2,9)*DR(-3) + C(2,10)$$

$$DR = C(3,1)*DM1(-1) + C(3,2)*DM1(-2) + C(3,3)*DM1(-3) + C(3,4)*DPDB(-1) + C(3,5)*DPDB(-2) + C(3,6)*DPDB(-3) + C(3,7)*DR(-1) + C(3,8)*DR(-2) + C(3,9)*DR(-3) + C(3,10)$$

VAR Model - Substituted Coefficients:

$$DM1 = 0.339648023655*DM1(-1) - 0.328506966907*DM1(-2) + 0.162953845078*DM1(-3) + 1.34658471517*DPDB(-1) - 0.844961927549*DPDB(-2) + 0.914088516753*DPDB(-3) + 38735.3116708*DR(-1) - 36246.9129662*DR(-2) + 46716.1250441*DR(-3) - 7062.23143346$$

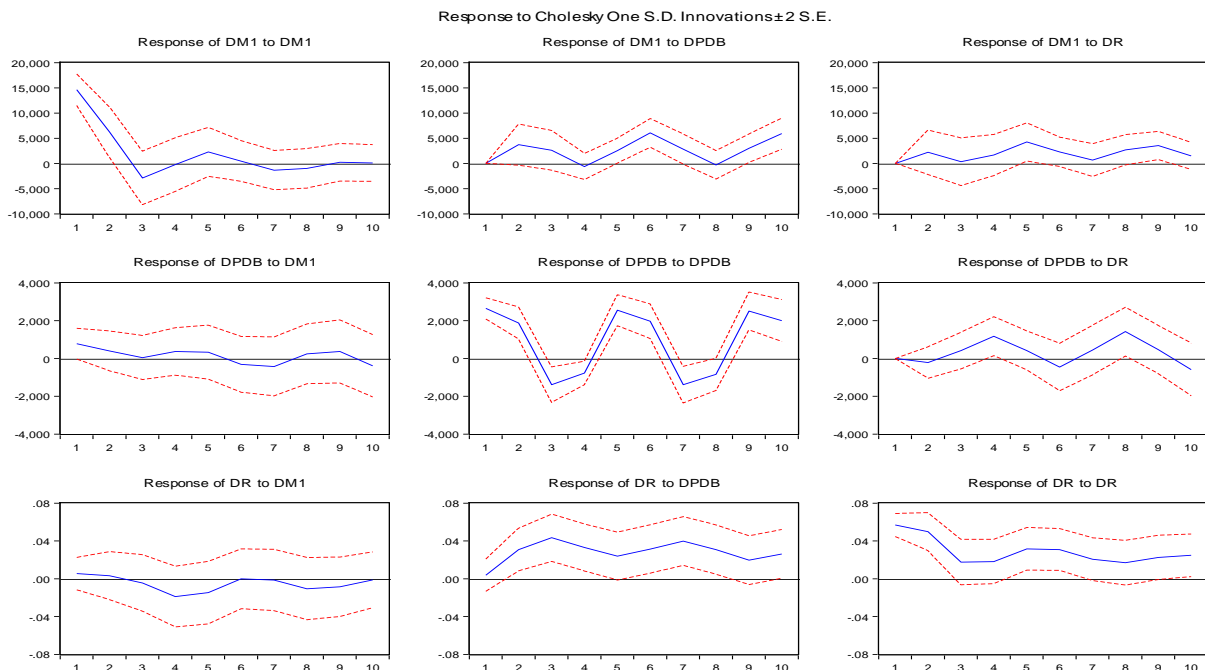
$$DPDB = -0.00974352997866*DM1(-1) + 0.0369101803249*DM1(-2) - 0.00659346613589*DM1(-3) + 0.712239674928*DPDB(-1) - 0.987312018336*DPDB(-2) + 0.641203668993*DPDB(-3) - 3817.33199951*DR(-1) + 13741.9958003*DR(-2) - 461.816509449*DR(-3) + 6026.52693176$$

$$DR = -6.62954868253e-07*DM1(-1) - 3.77280269785e-07*DM1(-2) - 1.53324301121e-06*DM1(-3) + 1.04192429191e-05*DPDB(-1) + 2.80648928531e-07*DPDB(-2) + 8.64059184516e-06*DPDB(-3) + 0.876398968573*DR(-1) - 0.391884678211*DR(-2) + 0.33513151383*DR(-3) - 0.12619001258$$

The first VAR model shows that money supply (DM1) is influenced by the money supply in the previous periods - from the first period in which DM1(-1) until the third period in which DM1(03), with different changes. This condition can be seen from the coefficient value of regression and t-statistic value which shows different number, in which the value in the first quarter is 0.339648 with t-statistic value of 1.97913 bigger than the t-table. Then the coefficient regression is -0.328506 in the second quarter before. After that, the coefficient value is 0.1629538 in the third previous quarter, with t-statistic that is smaller than t-table. This monetary phenomenon generally shows the trend of increasing money supply which is in accordance with monetary policy pattern made by the government which states that the trend of increasing money supply will continue to happen along with the increase of money demand for society's transaction. The regression coefficient of national income variable (DPDB) shows significant value of influence brought by national income variable (DPDB) in the previous quarter period, which generally shows an increasing trend from time to time. The previous economic performance significantly influences the next economic performance. Meanwhile, the regression coefficient value of interest rate (DR) is influenced by money supply (DM1) at the previous quarter with regression coefficient value which is relatively small (-0.0000015).

#### 4.4. Impulse Response Function

To complete VAR analysis, impulse response function analysis is done to find out the influence of shock to economy in overcoming the problem of interpreting the result of VAR analysis. The function of impulse response depicts the velocity of shock in one variable to the other variables until its influence disappears and it returns to a balanced position. In the other side, impulse response function can also trace the response of dependent variable if there is shock in  $u_1$  and  $u_2$ . The result of impulse response function analysis is shown below:



The analysis of impulse response function above shows that the center-left quadrant describes the change of DPDB as a response of the change in money supply (DM1). The first until the third quarter indicate a decrease in DPDB change in response to the change of money supply (DM1) with a relatively small response towards the balance point, then slightly increase in the fourth and fifth quarter, and drop back to the balance point in the sixth quarter. The



center quadrant describes the change of money supply (DM1) as a response to the change of DPDB. There is a pattern tendency that money supply (DM1) increases again after reaching the balance point as it can be seen that from the first quarter to the second quarter the money supply tends to increase, after that decreases in the third quarter and reaches the balance point in the fourth quarter. After that, the money supply (DM1) responds the DPDB change which is increasing, and so on. More or less the same pattern happens in the right quadrant which describes the change of money supply (DM1) to respond the change of interest rate (DR), in which the first quarter to the second quarter shows a tendency of the increase of money supply (DM1), then decreases and reaches the balance point in the third quarter. After that, it increases again and so on. What marks a difference with the previous pattern is that the change of money supply (DM1) which responds the change of interest rate has an intensity which is not too big.

#### 4.5. Analysis of Variance Decomposition

Analysis of variance decomposition provides an information about the movement proportion of shock influence in one variable to the other variables in one current period and in the next period.

Variance Decomposition of DM1:				
Period	S.E.	DM1	DPDB	DR
1	14618.26	100.0000	0.000000	0.000000
2	16466.65	93.13802	5.076813	1.785167
3	16922.28	91.09847	7.174384	1.727146
4	17016.83	90.10884	7.229424	2.661732
5	17866.82	83.37344	8.567275	8.059281
6	19011.82	73.69314	17.73732	8.569545
7	19277.14	72.16561	19.38244	8.451951
8	19491.30	70.84338	18.98189	10.17473
9	20039.43	67.03332	20.22025	12.74643
10	20945.90	61.35817	26.47367	12.16816

Variance Decomposition of DPDB:				
Period	S.E.	DM1	DPDB	DR
1	2762.469	8.088501	91.91150	0.000000
2	3367.519	6.828991	92.75646	0.414548
3	3664.771	5.782999	92.58685	1.630154
4	3942.426	5.866710	83.79824	10.33505
5	4727.737	4.571524	87.44553	7.982943
6	5150.456	4.214131	88.27060	7.515270
7	5367.967	4.505368	87.88921	7.605425
8	5621.128	4.294943	82.38610	13.31895
9	6184.823	3.908474	84.52085	11.57068
10	6538.842	3.850018	84.99226	11.15772

Variance Decomposition of DR:				
Period	S.E.	DM1	DPDB	DR
1	0.057178	0.899124	0.422405	98.67847

2	0.081911	0.595173	14.39153	85.01330
3	0.094461	0.682197	31.90240	67.41540
4	0.103457	3.913620	36.78639	59.29999
5	0.111754	5.093877	36.06818	58.83794
6	0.120135	4.408017	38.06935	57.52263
7	0.128255	3.879205	43.06447	53.05633
8	0.133395	4.212594	45.13206	50.65534
9	0.136961	4.386428	44.85752	50.75605
10	0.141636	4.109651	45.37668	50.51367

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Cholesky  
Ordering:  
DM1 DPDB  
DR

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The first table explains that the first period of money supply (DM1) is 100% influenced by the money supply (DM1) itself, while the other variables such as national income (DPDB) and interest rate (DR) contribute 0%. In the second period, the contribution of money supply (DM1) is as much as 93.13%, while national income (DPDB) is 5.07%, and the interest rate (DR) is 1.78%. In the third period, the contribution of money supply (DM1) is 91.09%, national income (DPDB) is 7.17 %, interest rate (DR) is 1.727 %. In the fourth period, money supply is 90.1%, national income (DPDB) is 7.22%, and interest rate (DR) is 2.66%. In the fifth period, the contribution of money supply (DM1) is 83.37 %, national income (DPDB) is 8.56 %, and interest rate is 8.06%. From the first table it can be seen that the contribution of national income (DPDB) to money supply (DM1) is gradual and stable, but the contribution of interest rate (DR) is rather drastic especially in the fourth period to the fifth period, where the contribution of interest rate (DR) in the fourth period is 2.66%, but increases sharply 8.06 % in the fifth period. This phenomenon shows that there is a process of transmission mechanism in monetary market, so that the change of interest rate (DR) can influence the money supply (DM1). The second table reveals a reality of the contribution of national income (DPDB) in the first period, in which the contribution of money supply (DM1) is 8.08 %, national income (DPDB) is 91.91 %, and interest rate (DR) is 0 %. This phenomenon shows that the contribution of money supply (DM1) to national income (DPDB) is relatively big and significant, as it can be seen that in the same period the contribution of money supply (DM1) is fairly big to the national income (DPDB). This phenomenon shows that the monetary policy is effective enough to influence the increase of economic growth in under employment condition as seen by the monetarists. The second period shows a reality of the contribution of national income (DPDB), in which the contribution of money supply (DM1) is 6.82 %, national income (DPDB) is 92.75 %, and interest rate (DR) is 0.4 %. The third period shows the fact about the contribution of national income (DPDB), in which the money supply (DM1) is 5.78 %, national income (DPDB) is 92.58 %, and interest rate (DR) is 1.63 %. The fourth period shows the contribution of national income (DPDB), in which the contribution of money supply (DM1) is 5.86 %, national income (DPDB) is 83.79 %, and interest rate (DR) is 10.33 %. The second table describes an interesting phenomenon in which the contribution of money supply (DM1) is relatively stable to the national income (DPDB), but is different with the contribution of the interest rate (DR) , in which there is a fairly big spike from the third period to the fourth period or from 1.63 % to 10.33 %. This phenomenon shows that monetary instrument – interest rate (DR) – is relatively very sensitive to influence economic growth (DPDB) after entering the third and fourth periods. The third table shows the fact about the contribution to interest rate (DR) in the first period, in which money supply (DM1) is 0.89 %, national income (DPDB) is 0.42 %, and interest rate (DR) is 98.67 %. This phenomenon shows that the contribution of money supply (DM1), national income (DPDB)

and interest rate (DR) are relatively significant, as it can be seen that in the first period the contribution of money supply (DM1) is significant enough as it is 0.89 %. This phenomenon shows that real market has a sensitive influence to monetary sector. The second period shows a reality of the contribution of interest rate (DR), in which the contribution of money supply (DM1) is 0.59 %, national income (DPDB) is 14.39 %, and interest rate (DR) is 85.03 %. The third period explains the fact about the contribution to interest rate (DR), in which the contribution of money supply (DM1) is 0.68 %, national income (DPDB) is 31.9 %, and interest rate is 67.41 %. The fourth period shows the contribution to interest rate (DR), in which the contribution of money supply (DM1) is 3.91 %, national income (DPDB) is 36.78 %, and interest rate (DR) is 59.81 %. An interesting phenomenon can be seen in which the contribution of money supply (DM1) is relatively significant and stable to the interest rate (DR), but it is different from the contribution of national income (DPDB) to interest rate (DR), in that there is a fairly big spike from the second period to the third period or from 14.39 % to 31.9 %. This phenomenon shows that real sector phenomenon has a relatively significant influence to the change of interest rate (DR).

## 5. Conclusion and suggestion

From the research about money supply in Indonesia, some information can be obtained :

1. Money supply has implications to goods market and monetary market which is reciprocal, which means that the dynamics of monetary market and goods market influence the money supply and vice versa, as shown in Granger causality test. Meanwhile, the influence of money supply to goods market in this research is shown by its influence to national income (DPDB).
2. In the first period, the change of money supply (DM1) is influenced 100 % by the money supply (DM1) itself, while other variables such as national income (DPDB) and interest rate (DR) contribute 0 %. Meanwhile, in the second period the contribution of money supply (DM1) is 93.13 %, national income (DPDB) is 5.97 %, and interest rate (DR) is 1.78 %. From variance decomposition analysis, it can be known that in the first period, the contribution of money supply (DM1) is influenced 100 % by money supply itself, while national income (DPDB) and interest rate (DR) contribute 0 %. Meanwhile, in the second period, the contribution of money supply (DM1) is 93.13 %, national income (DPDB) is 5.07 %, and interest rate (DR) is 1.78 %. This phenomenon shows that there is a process of transmission mechanism in monetary market, so that the change of interest rate (DR) can influence money supply (DM1). The contribution to national income (DPDB) in the first period consists of 8.08 % of money supply (DM1), 91.91 % of national income (DPDB), and 0 % of interest rate (DR). This phenomenon shows that the contribution of money supply (DM1) to national income (DPDB) is relatively high and significant, as it can be seen in the same period that the contribution of money supply (DM1) is fairly big to national income (DPDB). This phenomenon shows that monetary policy is effective enough to influence the increase of economic growth when the condition is under employment as seen by the monetarists. The second period explains the fact about the contribution of national income (DPDB), in which the contribution of national income (DPDB) is 6.82 %, national income (DPDB) is 92.75 %, and interest rate (DR) is 0.4 %.

The suggestions for this research are formulated as follows :

1. The transmission of mechanism in money supply to the real sector - the improvement of economic growth in Indonesia – needs the role and performance of the monetary

sector through enhancing the efficiency of monetary and banking institutions and eliminates economic distortion either in the real sector or monetary sector.

2. It is necessary to formulate appropriate monetary policy to face the global economic fluctuation using monetary instruments which can anticipate the change in global economy.
3. The improvement of macroeconomy fundamentals is done through policies of increasing exports, investment climates, the creation of good governance and clean governance, and increasing the efficiency of monetary sector as an intermediary institution.

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