

Analysis of Money Demand and Supply in Indonesia Two-Stage Least Square (2SLS)

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Abstract: Money supply and demand play an important role in monetary policy in Indonesia's economy. This research aims to date back the effects of product Indonesia (SNI) gross (GDP), the BI Rate, price index (CPI), skating and exchange rates (Exchange) on demand for money and supplies in Indonesia. Data processing using data with quantitative empirical models of demand for money is a function of product Indonesia (SNI) gross (GDP), the BI Rate and Consumer price index (CPI). While the empirical model of money supply was a product of Indonesia (SNI) (GDP) gross, slide price index (CPI) and exchange rates (exchange rate) over the period 1993-2017.

1 INTRODUCTION

One of the problems that often occur in developing countries in implementing development is how the country maintains stability and economic growth. Economic stability concerns the stability of prices and the level of national income. A series of policies can be carried out by the government in an effort to stabilize. For example monetary policy, fiscal policy that aims to achieve price level stability. The market balance and price or interest rate of equilibrium is reached when the demand and supply of money reaches a certain point of the same equilibrium. Request for money and supplies play an important role in monetary policy in their respective economies. This money is used as a means of Exchange, that is, intangible assets or other items that are generally accepted as payment. The money is held is also used as a store of value although it may be a small role in the economy.

The money can be used as a measure (medium account), basically the price usually expressed in units of money (Nopirin, 2008). Demand for money in the open economy will be greatly affected by the amount of the share, the ratio of experts through the BI Rate and is influenced by All price index continued to slide from time to time of the State (Mankiw, 2000). Offer money is the amount of

money that exists in the public in the form of the amount of cash and demand deposits then it is the stability of the exchange rate that could be construed as a stable exchange rate to prices of goods and services and a stable exchange rate against currencies other countries (Miskhin, 2009:111). Based on the data, demand and money supply (M2) in 1993 to 2017 fluctuates from year to year fluctuations.

Demand and money supply (M2) in 1998 the highest of 62.34%, a significant guardian that occurs due to the impact of the economic crisis that affected the demand and supply of money in Indonesia. And guardian occurred in 2005 16.33%, this is due to the guardian oil fuel prices. The following data on demand and money supply (M2) is as follows:

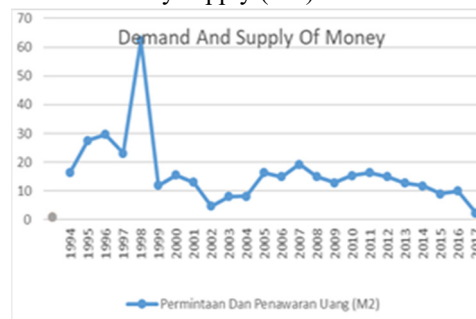


Figure 1: The rate demand and supply of money (M2) Indonesia Years 1994-2017.

In Act No. 23 of year 1999 on Bank Indonesia, explained that there is a main aim and tasks of the Bank Indonesia, which focuses on achieving and maintaining the stability of the exchange rate of the rupiah. Monetary instruments that a prime target to be accomplished is the stability of rupiah value including inflation and exchange rates. examines the factors that influence the amount of money in circulation.

This model is used in is the request for money with a quadratic cost function estimation using ECM (error correction model). The variable that is used in is for national, money supply, interest rate Indonesia (SNI) and exchange rates which found that the amount of money circulating in Indonesia can explain both phenomena of variable interest rates, to the national level, exchange rates.

Here the money supply in the long term is affected by the level of national and for exchange rates. This is them is the money supply in the long term is affected by the level of national exchange rates for positive and negative interest rates. The demand for money will increase if it is for real and request refused if the nominal interest rate rises (Manurung, 2009).

2 THEORETICAL FRAMEWORK

Money demand theory aims to develop determinants of demand for money, which is the function of money as a means of Exchange and optimization of the number of requests for money. The demand for real money will be higher if real transaction is higher, the classical theory of money demand is reflected in Irving Fisher. Irving Fisher in the theory of amount of money, essentially using money.

According to Keynes function Exchange not only money but as a value such as a Bank, which was then known as liquidity preference theory. Keynes gives rise to uncertainty and expectations as named approach Cambridge. However, Keynes's theory, it is more focused on the BI rate is variable variables important in liquid demand money (Mankiw: 2000). Keynes in the theory of the demand for money transaction motives, distinguishes between motive and motives that keep the speculation. Request money for purposes of the transaction and only in the case, meaning that the tagline for individuals or companies to pay cash transactions because they think that spending often occurs earlier than the money now (according to). This fee is not often predetermined, so cash is needed in the hand. Although the spending and to be expected with money in hand, the menu is still necessary, because

to be expected is not acceptable, or transaction fees for very important tagline is done before coming upon request, or may transactions provide a great advantage but with drawn before acceptance. While the request for money for speculation, according to Keynes, that the public wants a large amount of money for transactions purposes, because of the desire to give the most liquid form, apply the money. This saves cash has a function as a value such as a Bank or a money request for the assets of the demand for money. Request money for speculation this will be determined by the level of interest. The higher the interest rate, the lower the community's desire for cash. The reason is, if the level goes up, the cost of holding money opportunity Breadfruit is smaller. Conversely, the lower the interest rate, the greater the desire of society to hold cash (Nopirin, 2007:117).

Reflection-Flemming is an economic model which IS-LM framework in a small open economy, which can also be used to analyze the effect of monetary policy on the exchange rate (Flemming, 1962, and reflection, 1962). IS-LM model and reflection-Flemming assume that price level is fixed and shows what causes fluctuations in the short term for the combined. (Medyawati Yunanto, 2011).

3 RESEARCH METHOD

The research adopted annual data covering the period 1993-2017 from the National Bureau Statistics (BPS) and the Central Bank of Indonesia (BI). Processing of collected data is done using statistical program packages, such as Microsoft Excel and Eviews 9.0.

The estimation model used in this study is Two Stage Least Square (2SLS). The model in research is the demand for money in the form of exponential functions (Manurung J and A.H, 2009: 223) and Mindell Fleming money offerings.

$$\ln \frac{M_t}{P_t} = \alpha_0 + \alpha_1 \ln(Y_t) + \alpha_2 R_t + \mu_t \quad (3.1)$$

It is known that the value of $R_t = r_t + \pi_t$ where r_t is the real interest rate and substitution of the nominal interest rate (R_t) with $r_t + \pi_t$ will change the money demand model as follows:

$$\ln \frac{M_t}{P_t} = \alpha_0 + \alpha_1 \ln(Y_t) + \alpha_2 (r_t + \pi_t) + \mu_t$$

Where π_t = expectations of CPI, $\lambda = \alpha_0 + \alpha_1 Y_t + \alpha_2 r_t$ and $\alpha = \alpha_2$

$$\ln M_t/P_t = \lambda + \alpha \pi_t + \mu_t \quad (3.2)$$

For example $\ln(M_t) = m_t$ dan $\ln(P_t) = p_t$ so that equation (3.2) changed to: $m_t - p_t = \lambda + \alpha \pi_t + \mu_t$ 3.3)

If the value of the inflation expectations of the period (t) is the weighted average of the inflation of the previous period:

$$\pi_t - \pi_{t-1} = \rho (\Delta p_t - \pi_{t-1}) \quad 0 \leq \rho \leq 1 \quad (3.4)$$

Based on *clower or cash in advance constraint* [$Y = M_t + B_t$], lagrange function from *expected utility* and FOC or *First Order Condition* each of them:

$$\begin{aligned} L &= q u \frac{M_t}{P_{t+1}} (1-q) u \frac{M_t + B_t (1+R)}{P_{t+2}} + p \\ [Y - u M_t - B_t] & \\ M_t, B_t, \lambda & \\ &= q u' \frac{C_{t+1}}{P_{t+1}} + (1-q) u' \frac{C_{t+2}}{P_{t+2}} - P = 0 \\ &= (1-q) u' \frac{C_{t+2}}{P_{t+2}} - P = 0 \\ &= Y - M_t - B_t = 0 \\ & q u' \frac{C_{t+1}}{P_{t+1}} + (1-q) u' \frac{C_{t+2}}{P_{t+2}} = (1-q) \\ & u' \frac{C_{t+2}}{P_{t+2}} (1+R) \\ & q u' \frac{C_{t+1}}{P_{t+1}} + (1-q) u' \frac{C_{t+2}}{P_{t+2}} q u' (1-q) \\ &) u' \frac{M_t}{P_{t+1} P_{t+2}} = R (1-q) u' \frac{[M_t + (Y - M_t)(1+R)]}{P_{t+2} t + 2} \end{aligned} \quad (3.5)$$

equations can be written in form (Manurung, 2002):

$$\begin{aligned} q u' \frac{M_t}{P_{t+1}} - y P_{t+1}^{-1} R (1-q) u' [& \\ \frac{M_t + (Y - M_t)(1+R)}{P_{t+2}}] - y P_{t+2}^{-1} & \\ \left[\frac{M_t}{P_{t+1}} \right]^{-1} = \left[\frac{R(1-q)}{q} \right]^{1/y} \left[\frac{Y(1+R)}{P_{t+2}} \right]^{-1} \left[\frac{P_{t+1}}{P_{t+2}} \right]^{1/y} & \\ \left[\frac{P_{t+1}}{M_t} \right] = \left[\frac{R(1+q)}{q} \right]^{1/y} \left[\frac{Y(1+R) - R M_t}{P_{t+2}} \right]^{-1} \left[\frac{P_{t+1}}{P_{t+2}} \right]^{1/r} & \\ \left[\frac{P_{t+1}}{M_t} \right] = \left[\frac{R(1-q)}{q} \right]^{1/r} \left[\frac{Y(1+R) - R M_t}{P_{t+2}} \right]^{-1} \left[\frac{P_{t+1}}{P_{t+2}} \right]^{1/r} & \\ \left[\frac{P_{t+1}}{M_t} \right] = \left[\frac{R(1-q)}{q} \right]^{1/r} \left[\frac{P_{t+2}}{Y(1+R) - R M_t} \right] \left[\frac{P_{t+1}}{P_{t+2}} \right]^{1/r} & \\ \left[\frac{Y(1+R) - R M_t}{M_t} \right] = \left[\frac{R(1-q)}{q} \right]^{1/r} \left[\frac{P_{t+2}}{P_{t+1}} \right] \left[\frac{P_{t+1}}{P_{t+2}} \right]^{1/r} & \\ \left[\frac{Y(1+R) - R M_t}{M_t} \right] = \left[\frac{R(1-q)}{q} \right]^{1/r} \left[\frac{P_{t+1}}{P_{t+2}} \right]^{(1-y)/r} & \\ \left[\frac{Y(1+R) - R M_t}{M_t} \right] = \left[\frac{R(1-q)}{q} \right]^{1/r} [1 + \lambda]^{(y-1)/y} & \\ \frac{M_t}{Y} = \frac{(1+R)}{(1+\lambda)r/1 \left[\frac{R(1-q)}{q} \right]^{1/y} + R} & \end{aligned} \quad (3.6A)$$

$$M_t = \frac{(1+R)}{(1+\lambda)(r-1) \left[\frac{R(1-q)}{q} \right]^{1/y} + R} x Y \quad (3.6B)$$

$$\frac{B_t}{Y} = \frac{(1+\lambda)r/1 \left[\frac{R(1-q)}{q} \right] -}{(1+\lambda)r/1 \left[\frac{R(1-q)}{q} \right]^{1/y} + R} \quad (3.6C)$$

$$\frac{B_t}{Y} = \frac{(1+\lambda)r/1 \left[\frac{R(1-q)}{q} \right] -}{\frac{(1+\lambda)r}{1 \left[\frac{R(1-q)}{q} \right]^{1/y}} + R} x Y \quad (3.6D)$$

equation (3.6 A), (B, 3.6), (3.6 C) (3.6 D), each of which describes a request for money for a transaction and precaution and request money for speculation. Note that [$0 < q < 1$] request for money in terms of protection and functions of transactions decreased from slide price index (CPI) and the nominal interest rate (Rt). Request money for speculation is the decrease in function of the nominal interest rate (Rt) and function increases from launching price index (CPI). Request money for speculation will increase if the rising CPI called Tobin effect. It is therefore named the uncertainty and the preference element accentuates the Personality of consumption have a significant effect on the stock of money and speculation.

From the explanation above, the results show that the demand for money is determined by GDP, interest rates, and the price index (CPI) skating. So its current status is presenting the U.S. model as follows:

$$MID_t^* = a_0 + a_1 GDP_t + a_2 R_t + a_3 P_t \quad (3.7)$$

$a_1 > 0, a_2 < 0$ and $a_3 < 0$

the cost function consists of 2 components. The first component is the cost of imbalance and the second component is called the adjustment fee. While the parameters b1 and b2 are the weights given by economic agents on the two functions of these costs.

Furthermore, by minimizing the cost function of the equation with respect to Mt ($\alpha C_t / \alpha MID_t = 0$), the following equation is obtained:

$$\begin{aligned} \frac{\partial C_t}{\partial MID_t} - 2b_1 (MID_t - MID_t^*) + 2b_2 \{ & \\ (1-B)MID_t - f_t(1-B)Z_t \} & \\ = 0 & \\ b_1(MID_t - MID_t^*) + b_2 \{ (1-B)MID_t - & \\ f_t(1-B)Z_t \} & \\ = 0 & \\ b_1MID_t - b_1MID_t^* + b_2(1-B)MID_t - & \\ b_2f_t(1-B)Z_t & \\ = 0 & \\ b_1MID_t + b_2(1-B)MID_t = b_1MID_t^* + & \\ b_2f_t(1-B)Z_t & \\ b_1MID_t + b_2(1-B)MID_t - b_1MID_t^* + & \\ b_2f_t(1-B)Z_t & \\ MID_t = c MID_t^* + d f_t(1-B)Z_t + \mu_t & \end{aligned}$$

substituting equation (3.7) into equation (3.8), the equation is obtained as follows:

$$\begin{aligned} \alpha_0 + c \alpha_1 GDP_t + c \alpha_2 R_t + c \alpha_3 P_t + d f_t(1-B) & \\ \alpha_0 + \alpha_1 GDP_t + \alpha_2 R_t + \alpha_3 P_t + \mu_t & \quad (3.8) \\ MID_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 R_t + \alpha_3 P_t + \mu_t & \\ & \quad (3.9) \end{aligned}$$

$$\begin{aligned} \ln MID_t &= \alpha_0 + \alpha_1 \ln GDP_t + \alpha_2 \ln R_t + \alpha_3 \ln P_t \\ \Delta \ln MID_t &= \alpha (\ln MID_t^* - \ln MID_{t-1}) \\ \Delta \ln MID_t &= \alpha MID_t - \ln MID_{t-1} MID_t = Ms_t \quad (3.10) \end{aligned}$$

$$\alpha_0 + \alpha_1 \text{GDP}_t + \alpha_2 P_t + \alpha_3 R_t = \beta_0 + \beta_1 \text{GDP}_t + \beta_2 \text{kurs}_t - \beta_3 R_t$$

$$\alpha_0 + \alpha_1 \text{GDP}_t + \alpha_2 P_t - \beta_0 - \beta_1 \text{GDP}_t - \beta_2 \text{kurs}_t - \beta_3 R_t = -\beta_3 R_t + \alpha_3 R_t$$

$$\alpha_0 + \alpha_1 \text{GDP}_t + \alpha_2 P_t - \beta_0 - \beta_1 \text{GDP}_t - \beta_2 \text{kurs}_t = 0$$

$$(\alpha_0 - \beta_0) + (\alpha_1 - \beta_1) \text{GDP}_t + \alpha_2 P_t + \beta_2 \text{kurs}_t = 0$$

$$M_{S_t} = \beta_0 + \beta_1 \text{GDP}_t + \beta_2 P_t + \beta_3 \text{kurs}_t + \beta_4 M_{S_{t-1}} + \varepsilon_{1t} \quad (3.12)$$

$$M_{S_t} - \text{GDP}_t = \beta_0 + \beta_2 P_t + \beta_3 \text{kurs}_t + \beta_4 M_{S_{t-1}} + \varepsilon_{1t}$$

The process reduce the form carried out to know the exogenous variables in the system of simultaneous equations. As for the form of the reduce form is

$$M_{d_t} = \Pi_{10} + \Pi_{11} \text{GDP}_t + \Pi_{12} R_t + \Pi_{13} P_t + \Pi_{14} M_{d_{t-1}} + \varepsilon_{1t}$$

$$M_{S_t} = \Pi_{20} + \Pi_{21} \text{GDP}_t + \Pi_{22} P_t + \Pi_{23} \text{Kurs}_t + \Pi_{24} M_{S_{t-1}} + \varepsilon_{1t}$$

Where:

M_{d_t} : demand money (Billion Rupiah)

M_{S_t} : supply money (Billion Rupiah)

GDP_t : GDP (Billion Rupiah)

R_t : BI Rate (%)

P_t : Consumer Price Indeks (%)

kurs_t : Kurs (Rp/USD)

4 RESULT AND DISCUSSION

4.1 Models of Demand Money

The results of the estimation equation of demand money in this research are:

$$M_{d_t} = -4.696056 + 1.056734 \text{GDP}_t + 0.549318 R_t + 0.609643 P_t + 0.205024 M_{d_{t-1}} + \varepsilon_{1t}$$

Gross domestic product (GDP), the BI Rate, consumer price index (CPI) are jointly significant effect against the request for money in Indonesia. The results showed that the change request money influence on the change of the gross domestic product (GDP) in Indonesia with a coefficient of positive 1.056734 and not significant at the 90 percent level of confidence. This shows that the gross domestic product (GDP) increased significantly will have no impact on the demand for money. In accordance with the view of Keynes and Friedman that when gross domestic product (GDP) rose then spending more and also so that the demand for money increases.

The influence of variable BI Rate (R_t) is positive and significant at the level of not pronounced = 5%. This research is not in accordance with the theories of Keynes and Friedman who stated that the BI Rate

(R_t) is high will encourage people buy more bonds (securities) and equities and reduce cash money.

Then the regression coefficient of the consumer price index (P_t) by 0.609643. This means that if the consumer price index (P_t) rose by 100 percent will increase the demand for money amounted to 60.09 percent. The influence of the consumer price index (P_t) is positive and significant at the 5% level of confidence.

According to the theory of Keynes explained that the lower price level with a constant nominal amount of money, the amount of money cause rill in terms of goods and services to be purchased then gets bigger. The greater the amount of money in the sense of a rill that produced the lower price levels and cause interest rates to drop. According to Nopirin (2009:90) which States that the increase in the money supply will lead to a rise in the aggregate that will have an impact on the price increase (CPI rise).

Certain number of transactions (fixed) with each passing day. In other words, the need for funds (cash) unity of time is constant. The results of this study showing that national income (GDP) a positive effect against the amount of money in circulation, in tune with some of the earlier research, such as that done by Opolot (2007) in Uganda, Prawoto (2000), Dobnik (2011) in OECD countries, Azim P.et.al. (2010) in Pakistan, and Dharmadasa and Nakanishi (2013) in Sri Lanka. And research conducted Arif Widodo (2015) using motode ECM shows the analysis results of influence of gross domestic product against a request for money with a model Error Correction short term good Models do not have an effect on the demand for money. This is because the money used in order of wealth storage (store of value), while in the long run, showed that the gross domestic product of positive and significant effect against the request for money. These results fit with the theory presented House Classics (Quantity theory of money), that money demand is influenced positively by revenue. One of the characters is Fisher, who said that the demand for money is a very liquid interest to meet the transaction motive.

The BI Rate variable has no effect against a request for money in Indonesia. with a coefficient of 0.549318 and greater probability ($0.2472 < 0.05$) were not significant at pronounced = 5%. This means that in the event of a change in interest rates 1 percent then requests money will increase by 0.549318 per cent, ceteris paribus. This is due to be seen based on the existing data has increased the interest rate of 17.38% in 1997 to become 41.42% in 1998 and 12.64% decline in 1999. In the period 1997-1999 where interest rates are having fluctuations, it is not followed by a request for

money M2. Request money M2 has increased from 355,643 billion dollars in 1997 to become 577,381 billion rupiah in 1998 and had increased again 646,205 in 1999. At the time of the crisis of 1998 the Bank Indonesia raised interest rates intended to withdraw money in community by way of saving, but the community will prefer to hold cash money rather than save the money in the bank, because of distrust the community's response to banking.

This is in accordance with the research conducted by Egoumr Bossogo Philippe (2000), Prawoto (2000), Ahmad y. Abdulkheir (2013), Cep Jandi Anwar and m. Pipin Andria (2016) that interest rates positive effect to a request for money. And according to research conducted Egoumr Bossogo, Philippe (2000) did a study about "Money Demand in Guyana" in 1990 – 1999, with approach to ECM. Studies conducted by Egoumr Bossogo Philippe focus the determinants of demand for money that is real income, interest rates, and exchange rates to request money type M2. The results of a regression analysis approach to ECM pointed out that interest rates on savings has a positive relationship to a request for money. A decrease in the NER (Nominal Exchange Rate) and inflation insignificant against the demand of money in the long run. The movement of the exchange rate is an important factor that affects the stability of prices.

4.2 Model of Supply Money

$$Ms_t = \Pi_{20} + \Pi_{21} PDB_t + \Pi_{22} P_t + \Pi_{23} Kurs_t + \Pi_{24} Ms_{t-1} + \varepsilon_{1t}$$

$$Ms_t = 17.80042 + 0.170267PDB_t + 0.673250 P_t - 0.001213Kurs_t + 0.099105 Ms_{t-1} + \varepsilon_{2t}$$

Estimation model of simultaneous Bidding money in Indonesia affected by gross domestic product (PDBt), BI Rate (Rt), the consumer price index (Pt), the exchange rate (Kurst).

The results showed that the regression coefficients of influential positive Gross Domesstik Product (GDP) of 0.7672 against Indonesia in the money supply. How ever the probability (0,7672 < 0.05) is not significant. Then the coefficients of the consumer price index (Pt) by 0.673250 is the magnitude of the contribution of the consumer price index (Pt) against the offer of money in Indonesia. 0.673250 with a positive and significant (0.000 < 0.05). If the consumer price index (pt) climbed 1

percent then the offer of money in Indonesia will be up by 673250 percent. Then the level of the consumer price index (Pt) to offer money in Indonesia.

The variable exchange rate of the rupiah (exchange rate) have a coefficient of -0.001213 is the magnitude of the contribution of the exchange rate of the rupiah (exchange rate) against the offer of money in Indonesia. The regression coefficient of the exchange rate of the rupiah (exchange rate) of 0.001213 but significant probability – (0.0007 < 0.05). If the variable exchange rate of the rupiah (exchange rate) rose to Rp 1/dollar then offer money in Indonesia will be down by 0.01213 percent. This is in accordance with the theory of Mundell Fleming (Mankiw, 2003:306-307) stating that there is a negative relationship with the exchange rate with the offer of money in which the higher rate then the net exports (the difference between exports and imports) the lower the decline it will impact on the number of dwindling output and will cause a (GDP) fall.

From the side of the equilibrium condition of the money market, money market and interest rate world determine income level. This equation States that offer real money balance M/P is equal to request L (r *, Y). The balance of the money market was at a time when the demand for money is equal to the level of its bid (M/P = L (r *, Y). When central banks increase the money supply, because the price level is assumed to be constant, the increase in the money supply would mean a rise in the real money balance. The rise in the real money balance shifts the LM curve * to the right. Shifting the LM curve * this means an increase in income and the depreciation of the exchange rate.

If a system of closed economy increase in the money supply will increase spending because of lower interest rates and encourage investment, in an open economy transmission monetary is different. The interest rate and the exchange rate becomes the determining variable in the transmission mechanism. The increase in the money supply pressing domestic interest rates, capital flows out of the economy as investors seek higher returns on investments elsewhere. The flow of capital out of this in order to protect the domestic interest rate does not fall below the world interest rate r *.

Table 1: Two Stage Lest Square Results (demand and supply of money in Indonesia)

| The Test Results Of The Demand And Supply Of Money (Two Stage Least Square) | | | | |
|--|-----------------|--------------------|-------------|--------|
| System: SIMULTAN | | | | |
| Estimation Method: Two-Stage Least Squares | | | | |
| Date: 11/19/18 Time: 13:22 | | | | |
| Sample: 1994 2017 | | | | |
| Included observations: 24 | | | | |
| Total system (balanced) observations 48 | | | | |
| | Coefficien t | Std. Error | t-Statistic | Prob. |
| C(10) | -4.696056 | 6.802391 | -0.690354 | 0.4942 |
| C(11) | 1.056734 | 0.668506 | 1.580740 | 0.1222 |
| C(12) | 0.549318 | 0.467424 | 1.175202 | 0.2472 |
| C(13) | 0.609643 | 0.244481 | 2.493623 | 0.0171 |
| C(14) | 0.205024 | 0.135456 | 1.513592 | 0.1384 |
| C(20) | 17.80042 | 7.226855 | 2.463094 | 0.0184 |
| C(21) | 0.170267 | 0.571158 | 0.298108 | 0.7672 |
| C(22) | 0.673250 | 0.138206 | 4.871365 | 0.0000 |
| C(23) | -0.001213 | 0.000330 | -3.679356 | 0.0007 |
| C(24) | 0.099105 | 0.108172 | 0.916181 | 0.3654 |
| Determinant residual covariance | | 147.2074 | | |
| Equation: MD=C(10)+C(11)*PDB+C(12)*SBI+C(13)*IHK+C(14)*MD(-1) | | | | |
| Instruments: MD(-1) PDB SBI IHK KURS C | | | | |
| Observations: 24 | | | | |
| R-squared | 0.784435 | Mean dependent var | 16.47833 | |
| Adjusted R-squared | 0.739053 | S.D. dependent var | 11.65817 | |
| S.E. of regression | 5.955336 | Sum squared resid | 673.8545 | |
| Durbin-Watson stat | 1.222581 | | | |
| Equation: MS=C(20)+C(21)*PDB+C(22)*IHK+C(23)*KURS+C(24)*MS(-1) | | | | |
| Instruments: MS(-1) PDB SBI IHK KURS C | | | | |
| Observations: 24 | | | | |
| R-squared | 0.864974 | Mean dependent var | 16.47833 | |
| Adjusted R-squared | 0.836547 | S.D. dependent var | 11.65817 | |
| S.E. of regression | 4.713320 | Sum squared resid | 422.0923 | |
| Durbin-Watson stat | 1.405147 | | | |

5 CONCLUSION

Stationary test results show that the level of the variable demand and money supply (M2) and index prices slide (Pt) is stationary. The variable demand and money supply (M2), Indonesia (SNI) gross

(GDPT), BI rate (Rt), price index slide (Pt) and exchange rate (kurst) 1 level difference stationary. While on 2 difference stationary level there is the variable demand and money supply (M2), Indonesia (SNI) gross (GDPT), price index slide (Pt), and non-stationary BI rate (Rt). The consumer price index (Pt) influential in (simultaneous) significantly to demand money in Indonesia. Consumer price index (Pt), the exchange rate (Kurst) effect significantly to

offer money in Indonesia.4)The exchange rate of the Rupiah (exchange rate) have a positive influence on the money Supply and significantly against Indonesia.

REFERENCES

- Ahmed Y. Abdulkheir. (2013). An analytical study of the demand for money in Saudi Arabia International Journal of Economics and Finance Vol.5, No.4.
- Arif Widodo. (2015). Faktor- Faktor Makroekonomi Yang Mempengaruhi Permintaan Uang Di Indonesia. Jurnal Ekonomi dan Studi Pembangunan, Vol. 16, No.1, April 2015, hal.63-72.
- Azim, P. et. al. (2010). Demand for money in Pakistan: an Ardl Approach, Global Journal of Management and Business Research, Vol. 10 Issue 9 (Ver 1.0) December, p. 76-80.
- Bank Indonesia, Laporan Tahunan (2014).
- Badan Pusat Statistik (BPS) Sumatera Utara. Indikator Ekonomi. Berbagai tahun Penerbitan 1997-2017.
- Basuki, Sulistyono. (2006) : 1. "Analisis Permintaan dan Penawaran uang pendekatan simultan".
- Cep Jandi Anwar dan M. Pipin Andria. (2016). Hubungan Variabel Makroekonomi Dengan Permintaan Uang di Indonesia Sebelum dan Sesudah Krisis Moneter. Jurnal Ekonomi-QU, Vol. 6, No.1, April 2016 Hal.68.
- Dharmadasa, C dan Nakanishi, M. (2013). Demand for money in Sri Lanka: ARDL Approach to Co-integration. 3rd International conference on humanities, Geography and Economics (ICHGE), January 4-5, 2013 Bali, p. 143-147.
- Dornbusch, Stanley Fischer dan Richard Startz. (2008). macroeconomic. New York : McGraw Hill.
- Phillipe, Egoum, Bossogo, (2000), Money Demand in Guyana. IMF papers.
- Fisher, I. (1930). "The Theory of Interest. The Macmillan Company". New York, NY.
- Engle, R.F and Granger, C.W.J (1987). "Cointegration and Error Correction Representation, Estimation and Testing. Econometrica, 55.
- Fleming, J. M. (1962) "Domestic Financial Policies Under Fixed and Floating Exchange Rates". IMF Staff papers.
- Gujarati, Damodar. (2006). "Dasar-dasar Ekonometrika". Erlangga: Jakarta.
- Mankiw, N, Gregory. (2000). "Teori Ekonomi Makro, Seri Terjemahan", Jakarta: Erlangga.
- Mankiw, N, Gregory. (2003). "Makro ekonomi", terjemahan : Fitria Liza, Imam Nurmawan, Jakarta: Penerbit Erlangga. 2006, 195.
- Manurung J, dan A.H. (2009). "Ekonomi Keuangan dan Kebijakan Moneter". Jakarta: Penerbit Salemba Empat
- Mishkin, Frederick S, (2009). "Economic of Money, Banking, Financial Market", Addison Wesley Longman, Singapura
- Nopirin, (2007). "Ekonomi Moneter II". Yogyakarta: Penerbit BPFE
- Nopirin., (2008). "Pengantar ilmu ekonomi: makro & mikro edisi ke-1". Yogyakarta: Penerbit BPFE.
- Nopirin, (2009). "Ekonomi Moneter II". Yogyakarta: Penerbit BPFE
- Opolot, J. (2007). A Re-examination of the demand for money in Uganda: nature and implication for money policy. The Bank of Uganda Staff Papers Journal, Vol. 1, No.1, p. 5-32.
- Prawoto, N. (2000). Permintaan uang di Indonesia Konsep Keynesian dengan pendekatan PAM. Jurnal Ekonomi & Studi Pembangunan Vol.1 No. 1 April 2000 hlm 1-13.
- Wulandari, (2010). "Penerapan metode 2SLS (Two Stage Least Square) pada model persamaan simultan untuk persamaan pendapatan nasional dan peredaran uang".