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Determinants of BI 7 – Days Reverse Repo Rate, GDP, and Exchange Rate Against the Money Supply

Tia Ichwani[1] & Chaerani Nisa[2*]

[1&2]Fakultas Ekonomi dan Bisnis Universitas Pancasila Jakarta
e-mail: tiaichwani@univpancasila.ac.id

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Abstract **:** *The size of a country's progress will always be seen from the economic growth in that country. No exception for developing countries such as Indonesia, economic growth will always be the centre of attention. In this era of globalization, the development of the money supply (both M1 and M2) in society is increasing and expanding. M1 implies money supply in a narrow sense, namely limited to currency and demand deposits, while M2 contains a fairly broad meaning or scope, namely savings, demand deposits, and foreign exchange. This study identifies BI-7 Days Repo Rate factors, national income (GDP), and an exchange rate that affects the money supply (M1).*

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1 INTRODUCTION

The size of a country's progress will always be seen from the economic growth in that country. No exception for developing countries such as Indonesia, economic growth will always be the centre of attention. To achieve high but stable economic growth, it is not accessible if the ability of macroeconomic variables does not follow it. Siregar et al. (2006) that macroeconomic stability can be seen from the impact of shocks of one macroeconomic variable on other macroeconomic variables. Suppose the shock effect causes large fluctuations in macroeconomic variables, and it takes a relatively long time to achieve long-term equilibrium. In that case, somebody can say that macroeconomic stability is vulnerable to change. If, on the other hand, the impact of shocks shows small fluctuations and the time to reach long-term equilibrium is relatively short, somebody can say that macroeconomic conditions are relatively stable.

Money has a considerable function in everyday life. Like the function of money as a means of payment in economic transactions, money cannot be separated from the process of monetary transactions in each country. Money can also be said as an indicator important in the economy of a nation. It is due to all economic activities: production, distribution, and consumption are closely related to money. Government in terms of, in this case, the central bank, as the monetary authority, often uses money instruments to carry out its economic policies, especially in the financial and banking.

Bank Indonesia as the Central Bank has three main task pillars, namely (Law No year 2004 article 8): 1) establish and implement monetary policy; 2) set and maintain the payment system; 3) regulate and supervise the bank. In carrying out its duties to regulate and maintain the payment system, Bank Indonesia has the species, namely issuing money as legal tender in Indonesia, including printing and circulation activities and regulating the money supply.

One of the crucial aspects of the monetary economic system is an analysis of the money supply. Monetary policy illustrates the policy used to overcome economic problems with the primary objective of maintaining the stability of the rupiah's value. The theory of financial effectiveness was initiated by classical theory. The classical approach that the monetarist later developed (Neo-classical) emphasizes monetary policy in overcoming economic problems. This opinion is based on the idea that the policy's effect financial on aggregate demand is direct (Nopirin, 2008).

The amount of interest rates influences the money supply. According to Keyness Theory, Keyness lays out his views on how interest rates are determined in the short run. Exchange rates play an important role in spending decisions because they allow us to translate prices from different countries into the same language. As one of the most significant economic forces, the influence of the developing economy is reflected in the development of Gross Domestic Product (GDP). According to Sukirno (2011: 34), Gross Domestic Product is the value of goods and services in a country produced by the factors of production belonging to the citizens of these countries and foreign countries. GDP growth is a variable most important in the analysis of economic growth because it is a measure of social welfare (Patatoukas, 2014).

2 Literature Review

Monetary Policy

Monetary policy is all efforts or actions of the Central Bank in influencing the development of financial variables (money supply, interest rates, credit, and exchange rates) to achieve specific economic goals (Litteboy and Taylor, 2006: 198) and Mishkin (2004: 457). As part of macroeconomic policy, the objective of monetary policy is to achieve macroeconomic policy objectives, including economic growth, job creation, price stability, and balance of payments balance.

Central banks carry out monetary policy; they carry out a series of economic arrangements or adjustments that work in both the goods and asset markets. Monetary policy aims to help achieve macroeconomic goals, including economic growth, job creation, price stability, and trade balance. The implementation of monetary policy affects spending, output, and employment in the short term, which leads to changes in the price level in the medium and long term.

Monetary policy is an effort to achieve a continuous economic growth level while maintaining price stability. For this purpose, the Central Bank or Monetary Authority seeks to strike a balance between stock of money with an inventory of goods to control inflation. The opportunity is achieved complete and smooth work in the supply/distribution of goods. Monetary policy is carried out among others, with one of but not limited to the following instruments: interest, minimum statutory reserves, intervention in the foreign exchange market, and the last resort for banks to borrow money when experiencing liquidity problems.

BI 7-Days Reverse Repo Rate

The BI 7-Days Reverse Repo Rate policy helped several banking institutions no longer wait up to a year to withdraw funds deposited at Bank Indonesia. Within seven days and multiples (14 days, 21 days, and so on), the bank can withdraw the money along with the latest interest set at the time of withdrawal. Indeed, the interest rate obtained is undoubtedly much lower than the BI Rate due to the shorter withdrawal range. Still, the results can be pretty significant because it affects the smooth distribution of credit to the public. It is also expected to minimize the risk of bad loans due to changes in interest rates per year, which can soar sharply, affecting customer expenses and income stability.

As the Central Bank, Bank Indonesia has determined and implemented monetary policy following its duties and authorities. In August 2016, Bank Indonesia changed its monetary policy related to the benchmark interest rate, from the BI Rate to the BI 7-Days Repo Rate, because it was deemed no longer effective in reflecting market conditions. The market also welcomed this change in monetary policy with positive expectations. In transmitting its benchmark interest rate, Bank Indonesia consists of several channels. Still, based on several considerations, Indonesia is a developing country and focuses on promoting infrastructure projects. Interest rates are certainly a concern in boosting the domestic economy. In addition, considering that Indonesia is a country that adheres to an open economic system, it is an indication of the relationship between the global economy and the Indonesian economy.

Gross Domestic Product

National income has a critical role in a country's economy. With federal income, the state can determine how efficiently the existing resources in the economy are used to determine how much the production of goods and services is. According to Sadono Sukirno, national income is the amount of income received by the factors of production used to produce goods and services in a particular year. He is representing the concept of Gross Domestic Product (GDP) and Gross National Product (GNP) or Gross National Product (GNP).

National income is one of the critical indicators to determine the economic conditions in a certain period. National income is GDP, both at current prices and at constant prices. GDP, Sadono Sukirno, in his book Macroeconomic Introduction Theory, national income is the amount of added value generated by all business units in a particular country. GDP at current prices describes the added value of goods and services calculated using current prices every year. Meanwhile, GDP constantly represents the added value of goods and services calculated using current prices in a specific year. GDP and GNP at current prices can be used to see the shift and structure of the economy, while constant prices are used to determine economic growth from year to year.

Money Supply (M1)

The money supply is the obligation of the monetary system (Central Bank, Commercial Bank, and Rural Bank/BPR) to absorb private absorption (excluding the central government and non-residents). Obligations that are components of the money supply consist of currency held by the public (outside Commercial Banks and BPRs), demand deposits, quasi-money owned by private absorbers, and securities other than shares issued by the monetary system owned by private absorbers. the remaining term of up to one year. (http://www.bi.go.id)

Sukirno (2011), in a narrow sense, the money supply is the currency in circulation plus demand deposits owned by individuals, companies, and government agencies. M1 (little money/transaction money) consists of currency and demand deposits. Currency is paper money and coins circulating in the community or cash in physical form. At the same time, demand deposits are defined as the balance of a checking account or current account held by the public at a bank.

Monetary policy transmission is a mechanism regarding the monetary policy process that is transmitted to influence the economy. By the ultimate goal of monetary policy in Indonesia, namely price stability, monetary policy transmission is ultimately expected to control inflation.

Framework

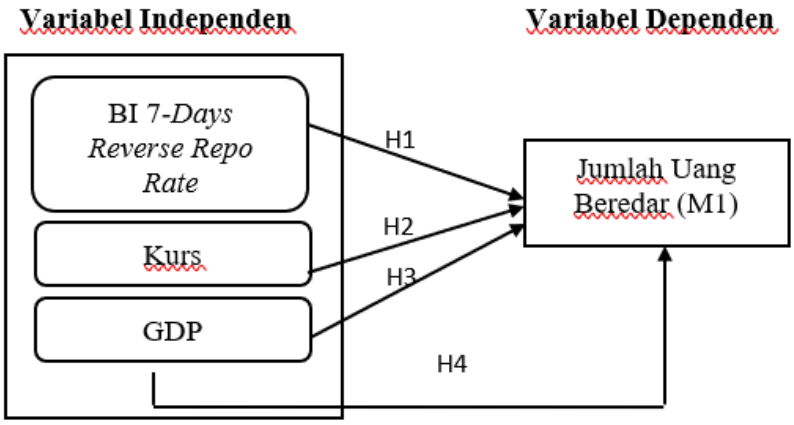


Figure 1. Research Framework

Hypothesis:
H_1: BI 7-Days Reverse Repo Rate has a significant effect on the Money Supply (M1).
H_2: The exchange rate has a significant effect on the Money Supply (M1).
H^3: GDP has a significant effect on the Money Supply (M1).
H_4: BI Rate 7-Days Reverse Repo Rate, Exchange Rate, and GDP significantly affect the amount of Money Outstanding (M1).

3 METHODS

Based on the research category, the data used is quantitative in BI 7-Days Reverse Repo Rate, Exchange Rate, National Income and the Money Supply. The dependent variable in this study is the money supply. Data

on the Money Supply used in this study is monthly data (monthly) in billions of rupiah obtained from www.bps.go.id during the observation period August 2016 – August 2019. The independent variables in this study consisted of BI 7-Days Reverse Repo Rate (X1), Exchange Rate (X2), National Income or GDP (X3).

4 RESULTS AND DISCUSSION

Descriptive statistics

Figure 2: Research Descriptive Statistics Test Results

	M1	BI7	KURS	PDB
Mean	1346432.	5.094595	13830.16	2560796.
Median	1372584.	4.750000	13707.00	2552297.
Maximum	1513520.	6.000000	15227.00	2818722.
Minimum	1126046.	4.250000	12998.00	2378146.
Std. Dev.	102113.4	0.680460	545.0764	126546.7
Observations	37	37	37	37

Source: Output Eviews

The table above shows that the number of observations (N) used in this study is 37 data from August 2016 to August 2019. The lowest (minimum) money supply (M1) is 1126046, and the highest (maximum) is 1452388 money supply (M1). From the table above, it can be seen that the average (mean) of the Money Supply (M1) is 1300123, and the coefficient of the standard deviation of the Total Money Supply (M1) is 88063.91. Data on the amount of money in circulation (in billions of rupiah) has a small distribution because the standard deviation coefficient is smaller than the mean value. Thus it can be said that the data on this variable has a low chance.

Classic assumption test

Autocorrelation Test

Figure 3: Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.674729	Prob. F(2,30)	0.5169
Obs*R-squared	1.549644	Prob. Chi-Square(2)	0.4608

Source: Output Eviews

The table above shows that the chi-square probability value of 0.4608 is more significant than 0.05, so it can be said that in the Autocorrelation test, the data used does not have autocorrelation, so it can be noted that the variables used to pass the Autocorrelation test.

Heteroscedasticity Test

Figure 4: Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoskedasticity			
F-statistic	2.453684	Prob. F(3,33)	0.0806
Obs*R-squared	6.748062	Prob. Chi-Square(3)	0.0804
Scaled explained SS	2.468201	Prob. Chi-Square(3)	0.4811

Source: Output Eviews

The heteroscedasticity test table above obtains a probability value greater than 0.05. The results of the Breusch-Pagan-Godfrey test show the probability value of F-statistics (F-Calculate) is more significant than Alpha (0.05) which is 0.0804, meaning that the X variable is more effective than Alpha (0.05), so it can be concluded, there is no heteroscedasticity problem in this data. So it can be said from the results of the Heteroskedasticity Test that the variables used do not contain Heteroskedasticity and are considered to have passed the Heteroskedasticity Test

Multicollinearity Test

Figure 5: Multicollinearity Test Results

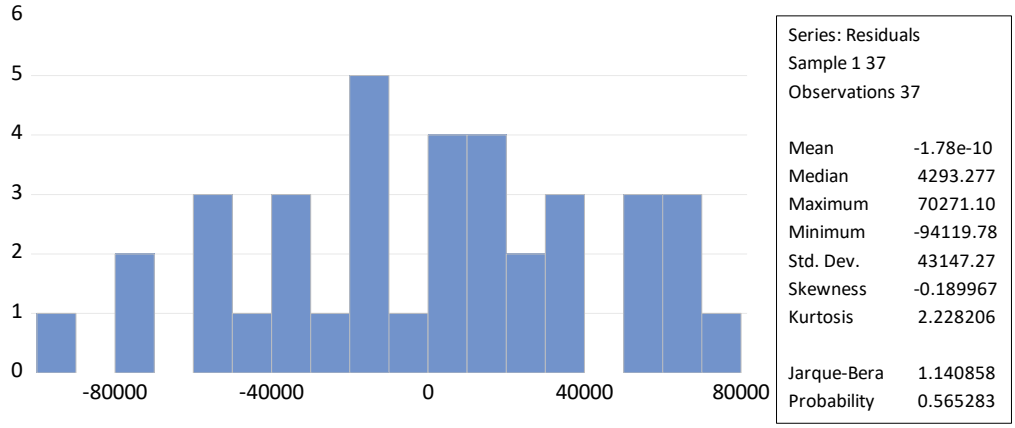
R-squared	0.361543	Mean dependent var	13830.16
Adjusted R-squared	0.343302	S.D. dependent var	545.0764
S.E. of regression	441.7131	Akaike info criterion	15.07174
Sum squared resid	6828867.	Schwarz criterion	15.15881
Log-likelihood	-276.8271	Hannan-Quinn criter.	15.10244
F-statistic	0.558384	Durbin-Watson stat	13830.16
Prob(F-statistic)	0.361543		

Source: Output Eviews

The multicollinearity test of the regression equation above shows that the R-square value of the regression equation above is 0.343302. So it can be concluded that there is no multicollinearity in the model.

Normality test

Figure 6: Normality Test Results



Source: Output Eviews

The results of the Normality Test above can be seen that the probability value (P-value) is 0.565283, which means that the P-value is > 0.05 (0.565283 > 0.05), so it can be concluded that the data used is usually distributed or passes the Normality Test.

Hypothesis test

Partial t-test

Figure 7: Partial T-Test Results in Ordinary Least Square Test

Dependent Variable: M_1
Method: Least Squares
Date: 09/01/21 Time: 13:39
Sample: 1 37
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-948971.9	226933.9	-4.181710	0.0002
BI7	-44051.75	16444.11	-2.678877	0.0114
KURS	55.54391	23.88132	2.325831	0.0263
PDB	0.684025	0.096046	7.121813	0.0000

Source: Output Eviews

The independent variable that has a significant effect on the dependent variable will have a tcount that is greater than the ttable. The ttable value for significant is 0.05 with df = n-k-1 or 37-2-1 = 34 so that the results obtained for ttable are 2.03224. If the t-test results produce a probability of less than 0.05, H0 is rejected, meaning that the independent variable affects the dependent variable.

H_1: b1≠0, BI 7-Days Reverse Repo Rate affects the Money Supply (M1).

The regression coefficient value of the BI 7¬-Days Reverse Repo Rate variable is -44051.75 with a tcount for the BI 7-Days Reverse Repo Rate of -2.678877 < 2.03224 and the significant matter is less than 0.05 (0.0114 < 0.05), it can be concluded that the influence of BI 7-Days Reverse Repo Rate is negative and significant to the Money Supply (M1).

H_2: b2≠0, Exchange Rate affects the Money Supply (M1)

The regression coefficient value of the Exchange rate variable is 55.54391 with the tcount for the Exchange rate of 2.325831 > 2.03224, and the significant matter is less than 0.05 (0.0263 < 0.05), it can be concluded that the effect of the exchange rate is positive and significant on the Money Supply (M1).

H_3: b3≠0, the exchange rate affects the money supply (M1).

The regression coefficient value of the GDP variable is 0.684025 with a tcount for the Exchange rate of 7.121813 > 2.03224 and a significant value less than 0.05 (0.0000 < 0.05), it can be concluded that the effect of GDP is positive and significant on the Money Supply (M1).

H_4: b1≠b2≠b3≠ 0, BI 7-Day Reverse Repo Rate, Exchange Rate, and GDP significantly affect the Money Supply (M1).

Figure 8: F . Test Results

Dependent Variable: M_1
Method: Least Squares
Date: 09/01/21 Time: 13:39
Sample: 1 37
Included observations: 37

R-squared	0.821458	Mean dependent var	1346432.
Adjusted R-squared	0.805227	S.D. dependent var	102113.4
S.E. of regression	45065.85	Akaike info criterion	24.37144
Sum squared resid	6.70E+10	Schwarz criterion	24.54560
Log likelihood	-446.8717	Hannan-Quinn criter.	24.43284
F-statistic	50.61008	Durbin-Watson stat	1.027723
Prob(F-statistic)	0.000000		

Source: Output Eviews

Fcount 50.61008. The resulting Ftable is df 1 (k-1) or 4-1 = 3 and df2 (n-k) = 37-4 = 33, the result of Ftable is 4.30. So Fcount > Ftable or 50.61008 > 2.89. The resulting probability is 0.000000 < 0.05 (α = 5%), it can be concluded that the BI 7-Days Reverse Repo Rate, Exchange Rate and GDP together affect the Money Supply (M1).

Linear Regression Analysis

Figure 9: Linear Regression Analysis

Dependent Variable: M_1
Method: Least Squares
Date: 09/01/21 Time: 13:39
Sample: 1 37
Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-948971.9	226933.9	-4.181710	0.0002
BI7	-44051.75	16444.11	-2.678877	0.0114
KURS	55.54391	23.88132	2.325831	0.0263
PDB	0.684025	0.096046	7.121813	0.0000

Source: Output Eviews

M_1 = -948971.9 - 44051.75*BI7 + 55.54391*KURS + 0.684025*PDB

1) A constant of -948971.9 states that if the BI 7-Day Reverse Repo Rate, Exchange Rate, and GDP are 0, the Money Supply will be negative at -948971.9.
2) The BI 7-Days Reverse Repo Rate (X1) coefficient has a negative value of -44051.75. If there is an increase in money supply by 1%, it will reduce the BI 7-Days Reverse Repo Rate by 44051.75%. In this case, other factors are considered constant.
3) The exchange rate coefficient (X2) has a positive value of 55.54391. If the Exchange Rate increases by 1%, the Total Money Supply will increase by 55.54391%. In this case, other factors are considered constant.
4) The GDP coefficient (X3) is positive at 0.684025. If the value of GDP increases by 1%, then the Money Supply will increase by 0.684025%. In this case, other factors are considered constant.

5 CONCLUSION

Variables Gross Domestic Product (GDP), BI 7 Days Repo Rate, and Exchange Rate simultaneously significantly affect the money supply rate (M1) in Indonesia for the 2016 - 2019 period. The exchange rate variable is known as the variable that has the most dominant influence on the inflation rate in Indonesia during 2016-2019 compared to the Gross Domestic Product (GDP) and BI 7 Days Repo Rate variables.

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