ANALYSIS OF THE MONEY SUPPLY AND INTEREST RATE OF INFLATION IN INDONESIA

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ABSTRACT

Articleaimed to assess and analyze the effect of money supply and the interest rate on Inflation in Indonesia. This research applied descriptive quantitative approach with the nature of the explanatory method verification. The data used was secondary data in the money supply, interest rate and Inflation in Indonesia in 2000-2014. The results of this article are the partial test (t-test) indicates the money supply (X1), the rate of interest (X2) and there is no effect on Inflation (Y). While the results of the simultaneous test (F test) shows a strong and direct relationship between money supply and the interest rate on inflation. This means that the money supply and interest rates affect the rise and fall of inflation in Indonesia.

Keywords: money supply, interest rate, inflation

INTRODUCTION

One of the macro-economic indicators that are used to see the stability of the economy of a country is inflation. Inflation is the increase in the prices of goods in general and applies continuously. This does not mean that the price of various goods rose by percentage. In this case, there can be the increases in a general price of goods continuously for a certain period, but if the increases that occurred only once although in a considerable percentage, it is not called as inflation. High inflation and an unstable reflection of the trend of rising price levels for goods and services are in general and continuously over a given period. The rise in the price level of goods production will affect the decline in production in the next period. Furthermore, it will impact on the decline in investment. The decline in investment leads to national income will drop, which in turn affects the stability of economic activity.

Based on the financial and economic statistics Indonesia, the inflation in 2000 – 2014 fluctuates. The highest inflation rate is in 2005 at 17,11%, and the lowest is in 2009 at 2,78%. Inflation period 2000 - 2014 can be seen in Table 1.

Table 1 Inflation in Indonesia at 2000-2014

YEAR	INFLATION	CHANGE
2000	9,35	-
2001	12,55	3,2
2002	10,03	-2,52
2003	5,16	-4,87
2004	6,40	1,24
2005	17,11	10,71

Table 1 Inflation in Indonesia at 2000-2014 (continued)

YEAR	INFLATION	CHANGE
2006	6,60	-10,51
2007	6,59	-0,01
2008	11,06	4,47
2009	2,78	-8,28
2010	6,96	4,18
2011	3,79	-3,17
2012	4,30	0,51
2013	8,38	4,08
2014	8,36	-0,02

(Source: BPS)

Many factors that affect the rate of inflation including the money supply and interest rates. A country's economic activity is never separated from money activities. Then, payment means money payment transactions regarding the amount of money in circulation. Changes in the money supply will affect the economic activities in various sectors. Increasing the excessive money supply can be boosted prices (high inflation) that exceeded the expected level so that in the long term could undermine economic growth. Conversely, if the increase in the money supply is very low, the economic downturn will occur. If this continues, the prosperity of society as a whole, in turn, will decrease. Thus, management of the money supply must always be done with care by considering the effect that will occur (Angraini, 2012).

The interest rate is one indicator of a healthy or unhealthy economy of a country. The interest rate is high or low will greatly affect the economy. The high-interest rates will encourage investors to put money in the bank rather than investing in the industrial sector, and the greater risk of inflation can be controlled. Conversely, when the interest rate falls, people are more likely to hold money from the savings in banks which caused the money supply increases. This makes the price of goods will increase.

The issues that will be examined in this article are (a) Is there any influence of the money supply and interest rate of inflation in Indonesia partially? (b) Is there any influence of the money supply and interest rate on inflation in Indonesia simultaneously?

While research purposes of this study are (a) To find out the effect of the money supply and interest on inflation in Indonesia partially, (b) To find out influence of the money supply and interest Rate on inflation in Indonesia simultaneously.

METHODS

This research uses quantitative methods by using approach deductive and inductive departing from the framework theory. The idea of experts or understanding the researcher based on his experiences that later developed into the problems and their solution proposed for justification in the form of support of empirical data in the field (Tanzeh, 2009). In this study, quantitative method is regressional, which aims to see the effect of one variable to another variable.

The technique of data collection is a way of collecting data that needed to answer the research problem formulation. The technique primarily is used in data collection of this article is a research library that the data collection in the form of documentation and other references from third parties. This article is limited to annual quantitative analyzing secondary data in the period between the years

2000 - 2014 with the availability considerations data. Data are any explanation or information on matters relating to the overall purpose of this research that using secondary data. Secondary data used for the article is conducted on the object that is macro and easily to get. Data are processed in accordance with the needs of the model used. Sources of data are derived from various sources, including Indonesia Statistics that published by the Central Statistics Agency, Economic and Financial Statistics Indonesia, the Monetary Policy Report that published by Bank Indonesia, and peer-reviewed scientific journals and other literature relating to the topic of this research. In addition, the authors also conduct a literature study to get the theory behind the research. Literature study is obtained through scientific journals and libraries.

Data analysis method is the processing of research data to obtain a conclusion after research data collected. Methods of data analysis in this study are the quantitative analysis technique simple regression and multiple linear regressions that are previously held assumption classical test. In this article, analysis of the data processed uses the program Statistical Product and Service Solutions (SPSS) version 20. The method of analysis uses Simple Regression Analysis, Multiple Regression Analysis, and Hypothesis Thesis.

Simple regression analysis is based on the functional relationship between independent variables with no dependent variable. The general formula of simple regression analysis is:

$$Y = a + bX + E \tag{1}$$

Where
Y= Dependent Variable
X = Independent Variaebel
a= a Constant Value
b = Coefficient of Regression
E = Error term

In a simple regression analysis, variables to be analyzed are as Money Supply (X_1) on Inflation (Y) and Interest rate (X_2) on Inflation (Y).

Multiple regression analysis is used to test the effect of independent variables on the dependent variable, in which multiple regressions is the number of independent variables that will be tested more than one.In multiple regression analysis, the variables will be analyzed.The general formula of multiple regressionis:

$$Y = a + b_1X_1 + b_2X_2 + E \tag{2}$$

Where
Y = Dependent Variable
X = Independent Variable
a = a constant value
b = coefficient of regression
E = Error term

Then, the hypothesis is a statement that will be verifiable. Test hypothesis is partial test (t-test) and a simultaneous test (F test). The partial test is used to test each independent variable whether the Money Supply (X1), Interest Rates (X2) has the positive and significant effect on the dependent variable, namely Inflation (Y) partially. Rule decision by t-test is using SPSS version 20 with significance level is set at 5% as follows (1) If the significance value > 0,05, then Ho is accepted and Ha is rejected, or partially independent variable has no effect on the dependent variable; (2) If the

significance value < 0,05, then Ho is rejected, and Ha is accepted, or partially independent variables affect the dependent variable discount.

The simultaneous test is used to see if the independent variable is total money supply (X1) and interest (X2) together have a positive and significant impact on the dependent variable, namely Inflation (Y). Criteria for decision making in the F test using SPSS version 20 with a significance level of 5% set is as follows (1) If the significance value > 0,05, then Ho is accepted and Ha is rejected, or not independent variables can explain the dependent variable or no influence between the variables tested; (2) If the significance value < 0,05, then Ho is rejected, and Ha accepted, or independent variables can explain the dependent variable or no influence between the variables tested.

There are several researches has discussed about this topic. Research byHerlambang (2012) that based on the results of multiple regression analysis states, the money supply, the government policy in the form of monetary policy that are able to increase the money supply can be carried out because it does not affect the rate of inflation. The exchange rate is not significant and positive impact on inflation. When the government risesthe interest rates SBI (*Sertifikat Bank Indonesia*/Bank Indonesia Certificates), government needs to conduct other policies that encourage people to be more productive, rather than lowering the profit from interest. While the SBI interest rate have a significant effect on inflation. The exchange rate (USD) is not significant to inflation hence the need for government efforts to stabilize the rupiah exchange rate against the dollar.

Research conducted by Nova Riana (2008), with linear multiple regression analysis, has found that the changes of SBI interest rate, exchange rates, and money supply provide a response to the effects of changes in inflation. Multiple regression analysis results liner stated that the biggest surprise explanatory fluctuations in inflation to interest rate changes SBI against inflation. The effect of changes in inflation surprises on the declining fluctuation changes but it still provides a great impact. On changes in inflation gives less influence in explaining the variation of exchange rate changes and the money supply changes. However, the ability of the inflation surprises more increased. In the speed of exchange rate is adjustments and significant enough to return to equilibrium. By using Multiple Linear Regression shows that the money supply, the SBI interest rate, and exchange rate have significant contribution in influencing inflation in Indonesia.

While conducting research on "The Effect of the Interest Rate of SBI and the Money Supply on Inflation Rate in Indonesia from 1995-2004" by using multiple regression analysis,calculation shows that the variable interest rate of SBI has a negative and significant effect on the inflation rate. A variable amount of money in circulation has a positive and significant impact on the inflation rate. With the value of adjusted R-square statistic (R^2) of 0,75, which means the independent variable in the regression model after adjusting held can explain the variation of thedependent variable by 75% and the rest is explained by other factors outside the equation. This may implies that the variable interest rate of SBI and the money supply can be explained by the strength 75% of the inflation rate in Indonesia.Rahmawati (2011) in her research has said that inflation is strongly influenced by the money supply and interest rates.

RESULTS AND DISCUSSIONS

In simple regression analysis, it finds out that how much influence between the money supply on inflation presented in following Table 2, 3, and 4. It shows the effect of JUB (*Jumlah Uang Beredar*/The Money Supply) (X_1) against inflation (Y).

Table 2 ANOVA[a] of JUB Against Inflation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	20,539	1	20,539	1,543	0,236[b]
Residual	173,032	13	13,310		
Tot Total	193,571	14			

Depenndent Variable: Inflation
Predictors: (Constant), JUB

ANOVA a significant level in Table 2 is 0,236 less than 0,05, so it can be concluded that the money supply (X1) has no effect on inflation (Y) or decision is 0,236 > 0,05. It can be said that there is no influence between JUB on inflation.

Table 3 Model Summary[b] of JUB Against Inflation

Model	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,106	0,037	3,64831

Predictors: (Constant), JUB
Dependent Variable: Inflation

The decision is 0,326 < 0,5R = + with conclusion that there is no strong and direct relationship between JUB with Inflation.

Table 4 Coefficients[a] of JUB Against Inflation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	10,170	2,012		5,055	0,000
JUB	-1,201E-006	0,000	-,326	-1,242	0,236

Depependent Variable: Inflation

Regression Equations:

$$Y = a + bX1 \tag{1}$$

a = constant value
b = Regression Coefficients
Y = Inflation
X1 = JUB
Y = 10,170 + (-1,201) X1 or Y = 10,17 0- 1,201X1

The following Table 5, 6, and 7 show the influence of Interest Rates (X2) Against Inflation (Y).

Table 5 ANOVA[a] of Interest Rates Againts Inflation

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	111,713	1	111,713	17,741	0,001[b]
Residual	81,858	13	6,297		
Total	193,571	14			

a. Dependent Variable: Inflation
b. Predictors: (Constant), Interest Rate

The decision is 0,001 > 0,05 with conclusion that there is no effect between interest rate (X_2) against inflation (Y).

Table 6 Model Summary[b] of Interest Rates Againts Inflation

Model	R	R Square	Udjusted R Square	Std. Error of the Estimate
1	0,760[a]	0,577	0,545	2,50934

redictors: (Constant), Interest Rate
 b. Dependent Variable: Inflation

The decision is 0760 > 0,5 and R = + with conclusion that the existence of a strong and direct relationship between interest rates with inflation.

Table 7 Coefficients[a] of Interest Rates Agiants Inflation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0,119	1,971		0,060	0,953
Interest Rate	0,891	0,212	0,760	4,212	0,001

Dependent Variable: Inflation

Regression Equations:

$$Y = a + bX2 \tag{2}$$

a   = constant value
b   = Regression Coefficients
Y   = Inflation
X_2 = interest rate
Y   = 0,119 + 0,891 X_2

In Table 8, 9, and 10 show the effect of JUB (X_1) and the interst rate (X_2) against inflation (Y) withmultipleregeression results.

Table 8 ANOVA[a] of JUB (X_1) and the Interest Rate (X_2) Againts Inflation (Y)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	113,834	2	56,917	8,566	0,005[b]
Residual	79,737	12	6,645		
Total	193,571	14			

Dependent Variable: Inflation

The decision is 0,005 > 0,05 with conclusion that there is no influence between JUB and interest rates on Inflation.

Table 9 Model Summary[b] of JUB (X_1) and the Interest Rate (X_2) Againts Inflation (Y)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,767[a]	0,588	0,519	2,57774

Predictors: (Constant), JUB, Interest Rate
Dependent Variable: Inflation

The decision is 0,767 > 0,5 and R = +, with conclusion that the existence of a strong and direct relationship between the JUB and Interest Rates on Inflation.

Table 10 Coefficients[a] of JUB (X_1) and the Interest Rate (X_2) Againts Inflation (Y)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1,429	3,406		-0,419	0,682
INTEREST RATE	0,971	0,259	0,828	3,747	0,003
JUB	4,60E-07	0	0,125	0,565	0,582

a. D Dependent Variable: Inflation

Regression Equations:

$$Y = a + bX1 + bX2 \tag{3}$$

a = constant value
b = Regression Coefficients
Y = Inflation
X1 = JUB
X2 = Interest Rate
Y = -1,429 + 4,600X1 + 0,971X2

Table 11 shows the test result T (partial) variable JUB (X_1) against Inflation (Y):

Table 11 Coefficients[a] of the Test Result T (partial) variable JUB (X_1) against Inflation (Y)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	10,170	2,012		5,055	0,000
JUB	-1,201E-006	0,000	-,326	-1,242	0,236

Dependent Variable: inflation

The decision is Sig 0,236 > 0,05 and T count (-1,242) < 1,77, with conclusion that partial JUB has no influence on inflation.

Table 12 Coefficients[a]of Test T Variable Interest Rate (X2) Against Inflation (Y)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0,119	1,971		0,060	0,953
Interest Rate	0,891	0,212	0,760	4,212	0,001

Dependent Variable: inflation

The decision of Table 12 is Sig 0,001 > 0,05 and T calculate 4,212 > 1,77. While the test results F (Simultaneous) shows in Table 13.

Table 13 ANOVA[a]of Test F Variable JUB (X1) and Interest (X2) Against Inflation (Y)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	113,834	2	56,917	8,566	0,005[b]
Residual	79,737	12	6,645		
Total	193,571	14			

a. Dependent Variable: inflation

b. PPredictors: (Constant), JUB, Interesr Rate

The decision of Table 12 is Sig 0,005 > 0,05 and 8,556 F count > 3,89.

CONCLUSION

This article aims to assess the effect of the money supply, the interest rate BI (Bank Indonesia) on the inflation rate in Indonesia during the period 2000 - 2014 using simple linear regression and multiple regression Linear. From the analysis and discussion that has been done, it can be concluded that to know the influence of the money supply on inflation and interest rates on inflation do partial test (t-test). Because t count = 0,236 is smaller than t alpha = 0,05 so it can be concluded that the Money Supply (X1) has no effect on inflation (Y). The next test variable X2 to Y where t is also smaller than t alpha, and it is also concluded that interest rate (X2) has no effect on Inflation (Y). Then to determine how much influence the money supply (X1) and interest rates (X2) on inflation in Indonesia that conducted the simultaneous test (F test). In conclusion, since F count is larger than F table, then the null hypothesis is rejected, and the hypothesis is the acceptable alternative. That is jointly variable in the money supply and interest rate effect on inflation in Indonesia.

Based on the conclusions from the results, then this part put forward some suggestions and recommendations as for controlling inflation through monetary policy can be achieved by controlling the money supply. The increase in the money supply should correspond to the real needs of society and adjusted with the inflation target of the Bank of Indonesia. Inflation can be suppressed with high-interest rates so that people are more likely to save money in the bank. For further research is recommended to add other variables that are expected to seek the best solution to overcome inflation in Indonesia.

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APPENDIX

Table 1 Development of Inflation, JUB, and Interest Rate in Indonesia 2000-2014

YEAR	INFLATION (%) Y	JUB (Billion) X_1	INTEREST RATE (%) X_2
2000	9,35	747,028	12,05
2001	12,55	786,741	16,59
2002	10,03	849,410	12,84
2003	5,16	944,366	6,61
2004	6,40	1,033,877	6,17
2005	17,11	1,202,722	11,84
2006	6,60	1,382,493	8,71
2007	6,59	1,649,662	8,00
2008	11,06	1,895,839	9,25
2009	2,78	2,141,384	6,50
2010	6,96	2,010,707	6,50
2011	3,79	2,571,213	6,00
2012	4,3	3,043,937	5,75
2013	8,38	3,465,392	7,02
2014	8,36	3,867,680	8,17