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The Effect of Money Supply and Interest Rates on Inflation in Indonesia

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Abstract
The determinant of a country with a stable economy is measured by the inflation rate which is the main factor in economic development, Inflation is a situation where price increases occur continuously in one period. The purpose of this study is to see the influence of Money Supply and Interest Rates in Indonesia. This research method uses ECM (Error Correction Model) and the data used is data from the period 2005 – 2020. The results of this study show that the Money Supply has a significant effect on Inflation. For interest rates, it shows results that have a significant effect on inflation. Based on the results of the study, in the long term the variable amount of money supply (X1) has no effect on the variable inflation (Y) in Indonesia, while in the short term the amount of money supply has an effect on inflation in Indonesia. For the Variable Interest Rate (X2) both in the long and short term it affects the inflation variable (Y) in Indonesia.

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1. Introduction

The desire of all developed and developing countries is to maintain economic stability. So that it is able to improve the economic welfare of the community and maintain economic growth so that it continues to progress in line with the times. For the general public, inflation is a concern because inflation directly affects the welfare of life, and for the business world, the rate of inflation is a very important factor in making various decisions. Inflation is also a concern of the government in formulating and implementing economic policies to improve people's welfare. The inflation target used is Consumer Price Index (CPI) inflation. CPI is the most appropriate measurement tool in measuring the level of people's welfare because the CPI measures the consumer cost of living index (Suseno 2009).

Inflation is one of the monetary events that shows a tendency to increase the price of goods in general, which means a decrease in the value of money. According to classical theory, what triggers the appearance of these symptoms is the occurrence of excess money in circulation due to the increase in the amount of money in society. Meanwhile, for Keynes' theory, this happens because there is a gap between people's economic capabilities and desired goods. And the similarity of the two theories is: the existence of additional funds to the community (Judiseno 2005). Inflation is generally considered an important problem that must be solved given the impact on the economy that can cause instability, slow economic growth and ever-increasing unemployment. Inflation is also a problem that every economy always faces, and inflation is also the main agenda of politicians and policymakers for the government. (Mishkin in Murti 2011).

For periods of price decline, called deflation, it is almost as much a period of price increases. The purpose of deflation itself is to stimulate production, employment, employment opportunities and increase the value of money (Khalwaty 2000). However, deflation is also one of the economic problems that is no less big than inflation. Deflation causes people to postpone shopping. One of the causes of deflation is that the supply of money is below demand, which means that people want money more than goods. As a result, the economy became sluggish. People become lazy to shop, so factories are lazy to produce goods. As a result, it triggered the problem of unemployment and the crime rate increased (Liembono and Rudy 2016). The problem of domestic production and raw materials that do not meet the needs of all people encourages the government to import goods from abroad to meet the needs of domestic consumers.

The following is a table of the development of Inflation, Money Supply (M2) and Interest Rates in Indonesia in 2010-2019.

Table 1. Inflation Development, Money Supply (M2) and Interest Rates in 2005-2020

Year	JUB(M2) (Billion)	Suku Bunga (%)	Inflation (%)
2005	271.140	12.8	10.6
2006	347.013	9.8	13.1
2007	450.055	8	6.5
2008	456.787	9.3	10.6
2009	515.824	6.5	4.3
2010	2.471.206	7	5.1
2011	2.87.7220	6	5.4
2012	3.043.937	6	4.3
2013	3.465.705	6	7
2014	3.868.129	8	6.4
2015	4.357.691	8	6.4
2016	4.698.477	6	3.5
2017	5.163.213	5	3.8
2018	5.518.337	5	3.2
2019	5.902.206	6	3
2020	6.520.383	4	2

Source: Central Statistics Agency, 2021.

From 2005-2020, fluctuations in the money supply, interest rates and inflation were shown. As an example, it can be seen in 2005 when inflation was at a high level in that year. Quoted from one of Detik *Finance's articles*, the biggest contributor to inflation was the increase in fuel prices with an increase in inflation of 3.47% as of October 1 and followed by transportation costs which automatically soared and caused inflation of 5.6% at that time. Aggravated by the condition of the money supply in the community which is not very rapid is one of the supporting factors for people's difficulties in stimulating the economy and inflation is getting worse.

At the same time, 2005 was the first year for Bank Indonesia's policy to operate the BI Rate policy. According to one of the Kompas articles at that time, this policy made Bank Indonesia a little confused, because since it was first set in July 2005, the BI Rate continued to creep up uncontrollably until it reached 12.8% at that time. Entering the last five years starting from 2017, the major contributors to general inflation in Indonesia throughout 2017 were core inflation and volatile inflation. Core inflation was the highest contributor group with a percentage of 1.82 percent. Meanwhile, in the non-core inflation component, the volatile component and government-regulated prices contributed 0.12 percent and 1.67 percent, respectively. For 2018, inflation was recorded at 3.13 percent or decreased when compared to the inflation rate in 2017 which reached 3.16 percent. The inflation rate in 2018 is still below the prediction of Bank Indonesia, which estimates the inflation figure in 2018 at 3.5 percent. In 2019, the inflation rate in general was recorded at 2.72 percent. The inflation rate decreased by 0.41 percent compared to 2018 (yoy) where the inflation rate was recorded at 3.13 percent. Entering 2020, there was a change in the calculation of inflation, which previously only grouped expenditure in 7 groups changed to 11 expenditure groups, besides that the coverage of the area also changed from 82 cities to 90 cities. The change in inflation calculation with the new method was welcomed by the condition of the Indonesian economy throughout 2020 which was haunted by the Covid-19 outbreak, which had such a big impact. The inflation target set by the government in 2020 is 3 percent, while inflation achieved by new methods and with the conditions that occurred at that time only reached 1.68 percent below the government's target.

The author is interested in discussing the influence of Money Supply and Interest Rates on Inflation and will be explained in a language style that will be outlined in the form of research. And also remembering that Indonesia as one of the large archipelagic countries that is rich in various resources that are very influential for the Indonesian economy itself. Of course, it will be an interesting topic with various factors that affect inflation, especially for the amount of money supply, where the increase in people's needs is increasing, both in basic needs to meet other lifestyle needs, money has an important role as a driver of the economy itself and the fulfillment of people's needs.

To prevent inflation from rising, the amount of money in circulation must be in accordance with aggregate needs (demand). If there is an excess of money supply to the need for money, the value of money will fall in such a condition that inflation will occur. Although it does not always have to be with money, interest rates also play a role as one of the monetary instruments that play an important role in controlling the economy and influencing economic policy determination. High interest rates will encourage people to invest their funds in banks rather than investing them in the production sector or industry which is much greater in risk when compared to investing money in banks, especially in the form of deposits (Khalwaty. 2000).

2. Method

This research is a type of quantitative research that takes Indonesia as the object of research, so the data needed is secondary data that has been published by agencies related to this research variable, namely BPS and Bank Indonesia. In addition, it is also read literature, journals or reports related to the research, to support the theoretical basics of the variables in this study.

The analysis method that will be used in this study is a quantitative analysis method. The method that will be used in this study is the testing *of time series* data used in econometric studies is often not stationary. Time *series* data that is not stationary is one of the causes of the conjecture results in the regression model that are often doubtful or called stubborn regression. In econometrics, there is a method to overcome this problem, namely by using *the Error Correction Model* (ECM). Based on these

reasons, this study uses *the Error Correction Model* (ECM). The software used in this study is Microsoft Excel 2010 and the Eviews 10 program.

3. Results and Discussion

3.1. Short-term

Based on the results of the test estimate from the dynamic (short-term) model of inflation in Indonesia in 2005-2020 as follows:

1) The Effect of Money Supply on Inflation

The value of the short-term money supply coefficient of D(JUB) of -2.11E-06 indicates that if there is an increase of 1 percent, inflation will decrease by 2.11E-06 percent with interest rates in constant states or other variables considered fixed *(cateris paribus).* The value of the coefficient on the money supply has a negative value, meaning that the money supply and inflation have a negative relationship in the short term. The probability value of the money supply of 0.0124 is smaller than the real level of 5%, so that the variable amount of money supply has a negative and significant influence on inflation in Indonesia in 2005-2020.

2) The Effect of Interest Rates on Inflation

The value of the Population Coefficient D (SUBU) in the short term of 1.059339 indicates that if there is an increase in the number of population by 1 percent, inflation will increase by 1.059339 percent assuming that the money supply is in a constant state or other variables are considered fixed *(cateris paribus)*. The value of the coefficient in the interest rate has a positive value, meaning that the interest rate and inflation have a positive relationship in the short term. The interest rate probability value of 0.0002 is smaller than the real level of 5%, so that the interest rate variable has a positive and significant influence on inflation in Indonesia in 2005-2020.

Based on table 4.8 of the results of the ECM estimation, the *Error Correction term* (E) variable shows the number 0.0000 which means significant at the real level of 5%. Therefore, the model specifications are correct so that the short-term relationship can be analyzed.

The results of the calculation using the *Error Correction Model* (ECM) method show a constant (C) of 0.900227, meaning that if all variables are considered fixed (*cateris paribus*) then D (INFLATION) will increase by 0.900227.

The estimated results of the short-term equation show an *R-squared* value of 0.895030, meaning that 89.50 percent of inflation in Indonesia in 2005-2020 can be explained linearly by the variables of the money supply and interest rates. While the remaining 10.50 is explained by variables outside the model.

The *F-statistical* value in the short-term equation is 31.264 with a probability value of 0.000011. The probability value is smaller than the real level of 5% so it can be concluded that there is a significant influence between independent variables, including the money supply and interest rates, on the dependent variable, namely inflation.

3.2. Long-term

Based on the results in table 4.6, it is concluded that the interest rate variable has a significant influence on the inflation variable at the 5% degree (0.0047 < 0.05). Analysis of the results of the equation of the effect of the long-term effect on inflation in Indonesia in 2005-2020:

1) The Effect of Money Supply on Inflation

The value of the money supply coefficient (X1) in the long term of 3.70E-07 indicates that if there is an increase in the money supply by 1 percent, inflation will decrease by 3.70E-07 percent assuming that interest rates are constant or other variables are considered fixed *(cateris paribus).* Therefore, in the long run, an increase in the money supply will reduce inflation in Indonesia. The probability value of the money supply of 0.2117 is greater than the real level of 5%, so the variable amount of money supply is insignificant and cannot affect inflation in Indonesia in 2005-2020.

2) The effect of interest rates on inflation

The value of the long-term interest rate coefficient (X2) of 0.952320 indicates that if there is an increase in interest rates by 1 percent, inflation will increase by 0.952320 percent assuming that the money supply is in a constant state or other variables are considered fixed *(cateris paribus)*. The value of the coefficient in the interest rate has a positive value, meaning that interest rates and inflation have a positive relationship in the long term. The interest rate probability value of 0.0047 is smaller than the real level of 5%, so interest rate variables are significant and can affect inflation in Indonesia in 2005-2020. The constant value (C) in the positive model is 0.353920, this means that if all variables are assumed to be zero, then the inflation variable tends to increase by 0.353920 percent. The probability value of C is 0.8989, which means that the value of the constant (C) has an insignificant influence on the modeling.

The value of the coefficient of determination (R-squared) is 0.774707, meaning that the variation can be explained linearly by the independent variable in the equation of 77.47 percent and the remaining 22.53 percent is explained by other factors outside the equation. The *F-statistical* value in the long-term equation is 22.35131 with a probability value of 0.000062. The probability value is smaller than the real level of 5% so it can be concluded that there is a significant influence between independent variables, including the money supply and interest rates, on the dependent variable, namely inflation. The long-term equation has been regressed, the next step is to test the *root unit* against the *residual* value of E using the *Augmented Dickey Fuller* (ADF) method.

4. Conclusion

Based on the results of the study on the influence of Money Supply and Interest Rates on inflation in Indonesia for the period from 2005 to 2020, it can be concluded as follows:

1) Based on the results of the study, it is shown that the probability value of the money supply of 0.0124 is smaller than the real level of 5%, so that the variable amount of money supply has a negative and significant influence on inflation in Indonesia in 2005-2020. From the results of the test, it can be interpreted that variable indicators of the money supply have a negative and significant influence on inflation in Indonesia. It can be seen from the data on the money supply. The amount of money supply is influenced by transactions that occur in the community, and where this will determine the price level of available goods and services. The more money available in society, the higher the price level of goods and services. However, there are times when the amount of money supply is not a determinant as long as a good or service has become a staple that must be met, so that the price is no longer an influence on how much money there is, the community will still meet the needs of the goods or services.
2) Based on the results of the study, it shows that the probability value of interest rates of 0.0002 is smaller than the real level of 5%, so that the variable interest rate has a positive and significant influence on inflation in Indonesia in 2005-2020. As one of the instruments in monetary affairs, it has a continuous relationship with inflation, where when there is an increase in interest rates, it will affect the rate of inflation. Although interest rates are not the main determining factor in some studies, they are still one of the factors that affect inflation.

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