# The Effect Of Money Supply, Interest Rates And Exchange Rates On Inflation In Indonesia For The Period 2005-2024

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*ABSTRACT*

*The results showed that the money supply, interest rates and exchange rates have a significant and joint effect on inflation in Indonesia. Partially the money supply has a positive and significant effect on inflation, interest rates have a significant and negative effect on inflation, and exchange rates have a positive and significant effect on inflation. This study was conducted to determine and describe the influence and relationship between money supply, interest rates and exchange rates as independent variables and inflation as the dependent variable. In addition, researchers are also interested in analysing the relationship of money supply, interest rates and exchange rates to inflation.*

*Keywords: money supply, interest rates exchange, rates and inflation*

## INTRODUCTION

Indonesia, as a developing country with an open economy, is vulnerable to changes in global factors such as international commodity prices, currency exchange rates, and monetary policies of major economies such as the United States. Indonesia often faces inflationary challenges that are influenced by both domestic and external factors. Uncontrolled inflation can be detrimental to the Indonesian economy, potentially reducing people's quality of life, increasing economic inequality, and exacerbating social instability to maintain economic stability, monetary policy is one of the efforts to control the rate of inflation, where monetary authorities implement policies that affect monetary indicators, interest rates, and money supply and exchange rates (Fitri Amaliyah & Aryanto 2022).

Figure 1 Inflation in Indonesia
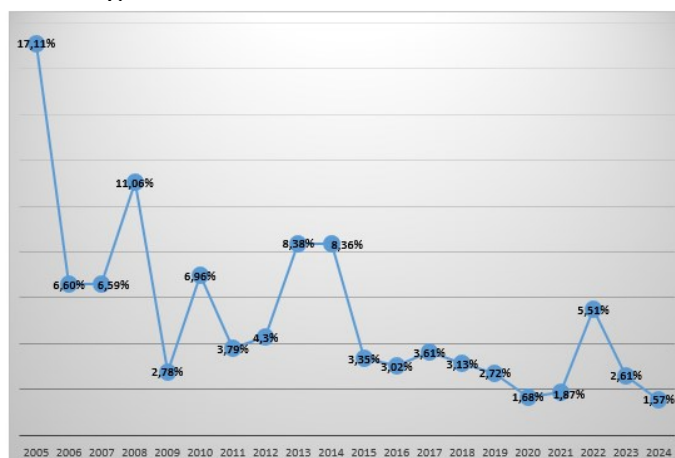


*Source: Bank Indonesia (bi.go.id), 2024*

Figure 1. Inflation data in Indonesia from 2005 to 2020 shows that inflation in Indonesia fluctuates due to uncertain increases and decreases over time. In 2005, Indonesia experienced the highest inflation rate at 17.11%, and in 2009, Indonesia experienced a decline of 2.78%. In 2013, inflation in Indonesia increased again to 8.38%. Then, in 2020, the inflation rate in Indonesia experienced a significant decline to 1.68%, and then in 2022, the inflation rate in Indonesia increased again to 5.51%. It can be said that uncontrolled inflation will create uncertainty for economic actors in making decisions, which ultimately reduces economic growth. One policy in controlling inflation is monetary policy. In general, monetary policy is carried out by the monetary authority to influence monetary variables, the money supply, interest rates, and exchange rates (Perlambang, 2010).

The money supply, interest rates, and exchange rates are the main factors influencing inflation in the economy. All three are closely related to people's purchasing power and the stability of prices of goods and services. One factor influencing inflation in Indonesia is the money supply. The level of money circulating in society can influence a country's inflation rate. The money supply refers to the total value of money held by the public, both in cash and demand deposits. In theory, the money supply will affect the value of money, which is reflected in the price and product levels. If the money supply is greater than the production of goods and services, prices tend to rise, which means the value of money decreases.

**Figure 2 JUB (Billions of Rupiah)**
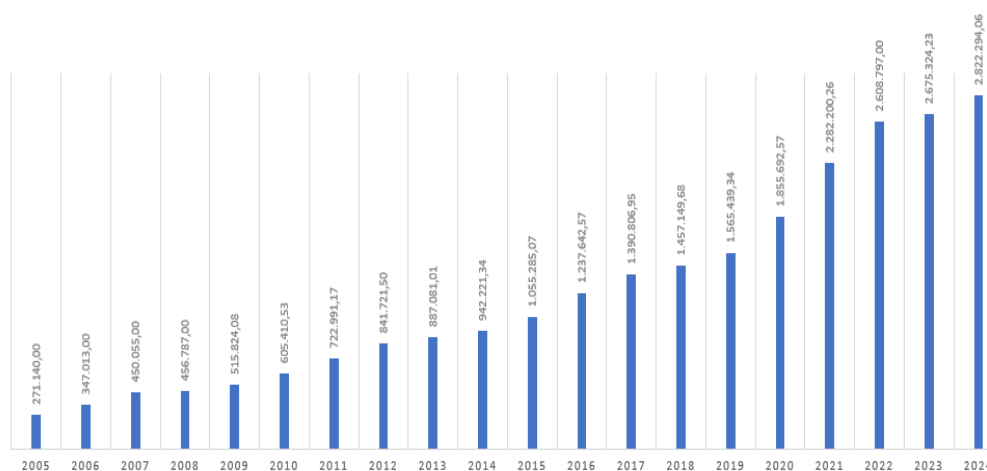


*Source: Central Statistics Agency (bps.go.id), 2025*

Figure 2 explains that the development of the Money Supply (JUB) increases every year, the Development of the Money Supply (JUB) from 2005 to 2022 experienced a significant increase where in 2005 the amount of money circulating in Indonesia was 271,140.00 billion Rupiah, then in 2022 the amount of money circulating in the community increased significantly, namely 2,608,797.00 billion Rupiah. This increase can be influenced by the inflation rate which experienced a significant increase in 2022.

Besides the money supply, another factor influencing inflation is the interest rate. The interest rate is the policy rate that reflects the direction of monetary policy set by Bank Indonesia and announced to the public. Typically, Bank Indonesia will raise interest rates if inflation is expected to exceed the predetermined target, while interest rates will be lowered if inflation is expected to fall below the predetermined target. Interest rates are set by the government with the aim of maintaining the stability of the country's economy. This interest rate is important to pay attention to because investors tend to expect higher investment returns. Raising interest rates is one of the main methods used by central banks to control inflation. Therefore, the influence of interest rates on inflation needs to be studied in depth because interest rates, regulated and determined by the government, aim to maintain the sustainability of a country's economy. Interest rates are one of the benchmarks in a country's economic activity, influencing money circulation, inflation, investment, and currency exchange rates (Ningsih & Kristiyanti).

**Figure 3 Interest Rates**
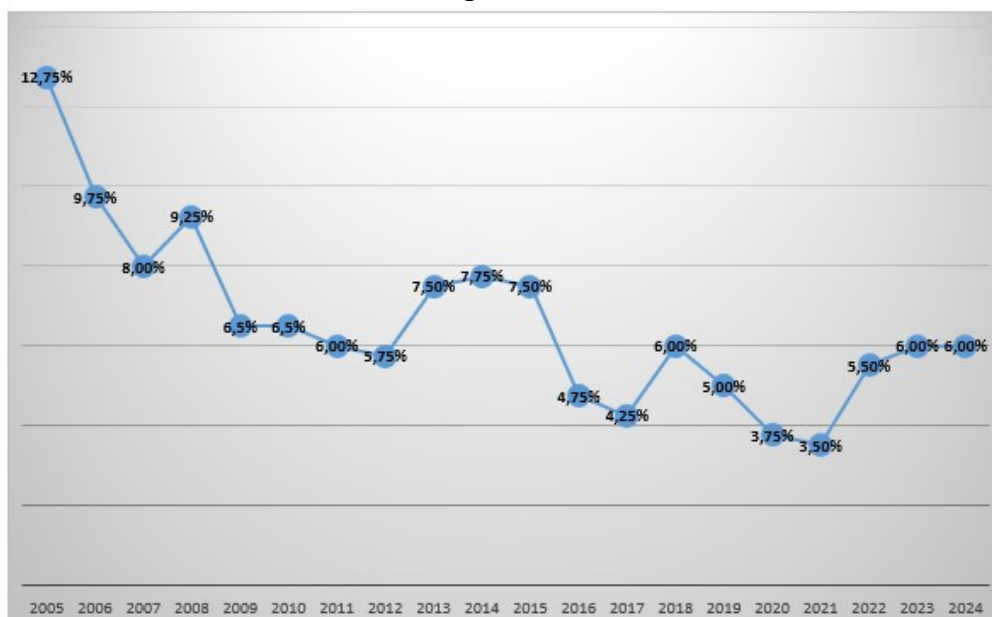


*Source: Central Statistics Agency (bps.go.id), 2025*

Figure 3 shows that interest rates fluctuated between 2005 and 2022. This can be seen from the 2005 interest rate, which was 12.75%. In 2012, it fell to 5.75%, then in 2015, the interest rate in Indonesia increased again to 7.50%. In 2022, the interest rate decreased to 5.50%. This is in line with the inflation rate, which decreased in 2020 to 1.68%, then in 2022 experienced a significant increase to 5.50%. The increase in interest rates is a step of the Front-loaded, pre-emptive, and forward-looking policy aimed at reducing high inflation rates.

The exchange rate is one of the macroeconomic variables that influences changes in inflation, as the stability of the inflation rate can be reflected through the stability of the exchange rate. The rupiah exchange rate is closely related to the inflation rate. Changes in the rupiah exchange rate against foreign currencies can affect the prices of imported goods and services domestically. If the rupiah exchange rate weakens, import prices tend to rise, which ultimately impacts the prices of domestic goods and services (Perlambang, 2010).

**Figure 4 Exchange Rate**
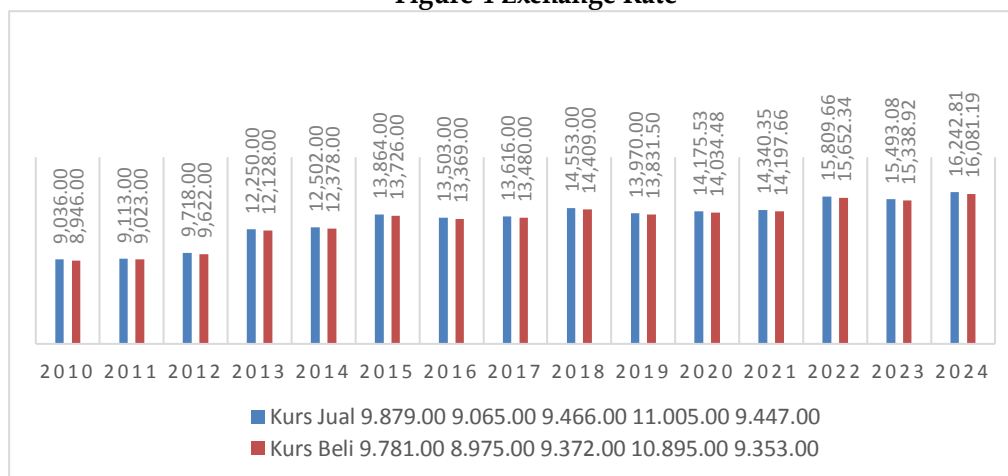


*Source: Bank Indonesia (bi.go.id), 2025*

Figure 4 shows that the exchange rate fluctuated between 2005 and 2022. This can be seen from the 2005 exchange rate of 9,879.00 and the buying rate of 9,781.00. However, this fluctuation continued with some increases, in 2023 the selling rate was recorded at 15,493.08. This increase was driven by inflation that affected people's purchasing power and currency stability, with the exchange rate in 2024 recorded at 16,242.81 for the selling rate and 16,081.00 for the buying rate. The increase in the exchange rate showed a stable upward trend, with a peak in 2023. The increase in the rupiah exchange rate could be influenced by the increase in inflation in Indonesia.

**RESEARCH METHOD**

A research approach is the method or approach used by researchers to obtain data related to the problem being studied. The research approach used in this study is a quantitative approach. Quantitative research is a process of discovering knowledge that uses numerical data as a tool to find information about what we want to know (Darmawan, 2014:37).

**Types of research**

The type of research used in this study is associative research. Associative research is used to test whether there is a relationship between one variable and another (Juliandi, 2014:86). In this study, the associative method was used to determine the effect of the money supply, interest rates, and exchange rates on inflation in Indonesia as moderating variables.

**Operational Research Variables**

The operational definition of this study uses one dependent variable and three independent variables. The operational definition of each variable in this study is as follows:

**Table 1 Operational Definition of Variables**

| No | Variables | Definition | Measurement Scale |
|---|---|---|---|
| 1. | Inflation (Y) | Inflation is a general and sustained increase in prices and services in an economy over a period of time. Inflation is measured using a price index, such as the Consumer Price Index (CPI). | Ratio |
| 2. | Money Supply ($X_1$) | The amount of money in circulation is all types of money in the economy, namely the amount of currency in the economy plus demand deposits in commercial banks. | Ratio |
| 3. | Interest Rate ($X_2$) | Interest is the fee charged by a lender to a borrower for the use of money, usually expressed as a percentage of the loan amount per year. | Ratio |
| 4. | Exchange Rate ($X_3$) | An exchange rate is the ratio between one currency and another, indicating how much of one currency can be exchanged for another currency. | Ratio |

## Data Types and Sources

**1.** Data Types

The type of data used in this study is quantitative data. Quantitative data is data in the form of numbers or figures. The type of quantitative data used in this study is time series data at the end of each year from 2005 to 2024. This data was obtained from sources such as documents, reports, and related publications, and includes data on the money supply, interest rates, exchange rates, and inflation. This time series data was chosen because it is relevant to the research objective, namely the influence of the money supply, interest rates, and exchange rates on inflation in Indonesia during that time period.

**2.** Data source

The data sources used are secondary data sources. Secondary data is data collected by researchers from existing sources or cited from sources other than primary data sources. This data consists of official records, documents or reports, scientific papers, magazines, and other sources that can support and complement the primary data. The data obtained in this study include the amount of money in circulation, interest rates, exchange rates, and inflation, which were taken officially from websites such as Bank Indonesia (https://www.bi.go.id) and the Central Statistics Agency (https://bps.go.id).

**Data collection technique**

The data collection technique in this study is data collection using the documentation method, a data collection method carried out by collecting various documents related to the research problem. In this study, data was obtained by observing, recording, and studying descriptions, notes, or documents obtained from the Indonesian financial economic report for the 2005-2024 period published by Bank Indonesia and the Central Statistics Agency. And also using the literature study method, this research is collecting data by studying and understanding books that have a relationship related to the amount of money in circulation, interest rates, and exchange rates to inflation in Indonesia. In addition to books, the literature study also uses other references from the latest news with reliable sources, and research results obtained from various journals. Literature studies are conducted to enrich knowledge about various concepts that will be used in the research process.

## RESULT AND DISCUSSION

**Research result**
**Multiple Linear Regression Equation Analysis**

Multiple linear regression analysis is used to determine whether the **relationship** between the independent and dependent variables is positive or negative. Three independent variables are used in this study: the money supply (X1), interest rate (X2), exchange rate (X3), and inflation (Y).

Based on the results of data processing with the Eviews 12 program, the following output results were obtained:

Table 1 Output Results of Regression Equation

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -4.449682 | 2.384070 | -1.866423 | 0.0804 |
| X1 | -1.21E-08 | 8.50E-09 | -1.421802 | 0.1743 |
| X2 | 1.455152 | 0.253842 | 5.732515 | 0.0000 |
| X3 | 8.67E-05 | 5.12E-05 | 1.692837 | 0.1099 |

Source: data processed by the author, 2025

Based on the table above, the multiple linear regression equation can be obtained as follows:

$$Y = -4.4496 - 1.2100 + 1.4551 + 8.6700 + e$$

The equation above can be explained as follows:

1. The constant of -4.4496 indicates that if the amount of money in circulation (X1), interest rate (X2), and exchange rate (X3) are considered constant, then the inflation rate is -44.9%.

2. The regression coefficient of the money supply (X1) is -1.2100, meaning that every time the money supply decreases, inflation also decreases by -12.1%.

3. The interest rate coefficient (X2) is 1.4551, meaning that every 1% increase in interest rates will increase inflation by 14.5%. Conversely, if interest rates decrease, inflation will also decrease.

4. The exchange rate coefficient (X3) is 8.6700, which means that every increase in the exchange rate will increase inflation by 86.7%. Conversely, if the exchange rate decreases, inflation will also decrease.

**Classical Assumption Test**

In regression analysis, one crucial step that should not be overlooked is the classical assumption test. The classical assumption test serves to ensure that the data generated in the regression equation is valid, consistent, and unbiased. The following are the results of the classical assumption test:
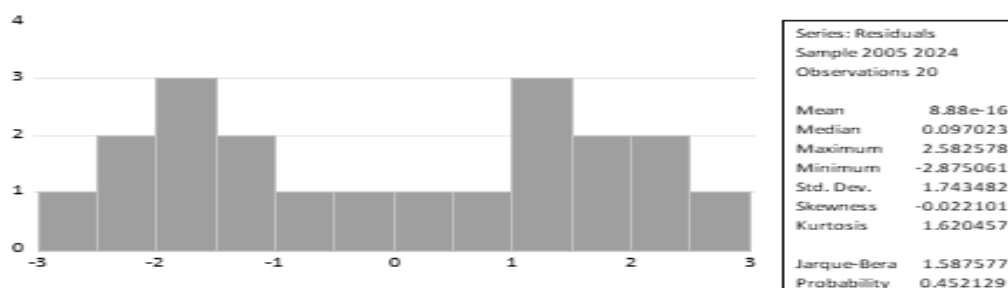
1. Normality Test

The normality test is the initial stage of the classical assumption test and is one of the processes that greatly influences the regression model. A good regression model is one that has normally distributed data. To determine whether the data used is normally distributed or not, this can be determined through a normality test. In this study, the variables whose normality was tested were Inflation (Y), Money Supply ($X1$), Interest Rate ($X2$), and Exchange Rate ($X3$). If the Jarque Bera test probability value is > 0.05 then $H0$ is accepted or the data is normally distributed. However, if the Jarque Bera test probability value is <0.05 then $H0$ is rejected or the data is not normally distributed. The basis for decision making in the normality test is as follows:

1. If the Jarque-Bera probability > 0.05 → Normally distributed
2. If the Jarque-Bera probability < 0.05 → Not distributed Normal

Table 2 Normality Test



Based on the results of the normality test, the Jarque-Bera probability value is 1.5877577, this value is > 0.05, so it can be concluded that the data is normally distributed or passes the normality test.

**Multicollinearity Test**

The multicollinearity test aims to determine whether a correlation exists between independent variables in the regression model. A good regression model should not exhibit any correlation between independent variables. The presence or absence of multicollinearity can be determined by the correlation coefficient between the independent variables. In accordance with the research methodology, multicollinearity was tested using the VIF (Variable Interval Intensity) to detect multicollinearity. If the VIF value is less than 10.00, it can be concluded that there is no multicollinearity. However, if the VIF value is greater than 10.00, multicollinearity is present.

Table 3 Multicollinearity Test

| Variables | Coefficient Variance | Uncentered VIF | Centered VIF |
|---|---|---|---|
| C | 5.683790 | 31.49195 | NA |
| X1 | 7.22E-17 | 8.782327 | 2.532074 |
| X2 | 0.064436 | 17.19926 | 1.647630 |
| X3 | 2.62E-09 | 7.026405 | 2.040949 |

Source: data processed by the author, 2025

Based on the table above, the VIF value is 2.532074 < 10.00, so it is concluded that there is no multicollinearity or it passes the multicollinearity test.

**Heteroscedasticity Test**

The heteroscedasticity test aims to examine whether there is inequality in the variance of residuals from one observation to another in the regression model. If the significance value is >0.05, it can be concluded that heteroscedasticity does not occur. However, if the significance value is <0.05, it can be concluded that heteroscedasticity does occur. Therefore, a good model is one that does not occur or is free from heteroscedasticity in a regression model. To determine the presence or absence of heteroscedasticity, this study examines the White test as follows:

Table 4 Heteroscedasticity Test

| F-statistic | 7.235250 | Prob.F (3,16) | 0.0028 |
|---|---|---|---|
| Obs*R-squared | 11.51323 | Chi-Squared Prob. (3) | 0.0093 |
| Scaled explained SS | 2.285910 | Chi-Square Prob. (3) | 0.5152 |

*Source: data processed by the author, 2025*

Based on the table above, it is known that the probability obs* R-squared value is 0.0093 < 0.05, so it can be concluded that the heteroscedasticity test assumption is influential or the data does not pass the heteroscedasticity test.

**Autocorrelation Test**

The autocorrelation test aims to determine whether there is a correlation between the nuisance error in period t and the nuisance error in period t-1 (previously) in a linear regression model. If a correlation occurs, it is called an autocorrelation problem. Autocorrelation arises because consecutive observations over time are related to each other. This problem arises because the residuals (nuisance errors) are not independent from one observation to the next. To detect the presence or absence of autocorrelation in this study, one way to identify it is by looking at the LM Test value.

Table 5 Autocorrelation Test

| F-statistic | 1.480329 | Prob. F(2,14) | 0.2611 |
|---|---|---|---|
| Obs*R-squared | 3.491207 | Chi-squared Prob. | 0.1745 |

Source: data processed by the author, 2025

From the table above, it is known that the probability value obs*R-squared is 0.1745 >0.05, so it can be concluded that this model is free from autocorrelation problems.

**Hypothesis Testing**

This test uses multiple linear regression analysis. This test aims to determine the extent to which the money supply, interest rates, and exchange rates influence inflation.
Partial Test (t-Test)

Table 6 T-Test (Partial Test)

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -4.449682 | 2.384070 | -1.866423 | 0.0804 |
| X1 | -1.21E-08 | 8.50E-09 | -1.421802 | 0.1743 |
| X2 | 1.455152 | 0.253842 | 5.732515 | 0.0000 |
| X3 | 8.67E-05 | 5.12E-05 | 1.692837 | 0.1099 |

Source: data processed by the author, 2025

The t-test (partial test) is used to test how each independent variable (X) individually influences the dependent variable (Y). The results of the hypothesis testing are based on data processing using Eviews 12. Based on the t-test (partial) above, the analysis results obtained are as follows:

a.       It is known that variable X1 has a t-statistic of -1.421802, with a significant probability value of 0.1743 > 0.05, so Ho is accepted, which means that the variable of the amount of money in circulation has a partial effect on inflation.

b. It is known that variable X2 has a t-statistic of 5.732514 with a significant probability value of 0.0000 < 0.05, so Ho is rejected, which means that interest rates have a partial effect on inflation.

c.It is known that variable X3 has a t-statistic of 1.692837 with a statistical probability value of 0.1099 > 0.5, so Ho is accepted, which means that the exchange rate has a partial effect on inflation.

F Test (Simultaneous Test)
Simultaneous testing to determine whether there is an influence between variable X1 (money supply), variable X2 (interest rate), variable X3 (exchange rate) together

affecting variable Y (inflation). Based on the results of the Eviews program calculations, they can be seen in the following table.

Table 7 F Test (Simultaneous)

| | | | Durbin-Watson stat | |
|---|---|---|---|---|
| f-statistic | 20.19790 | 177.9686 | | 2.294550 |
| Prob (f-statistic) | 0.000011 | 0.000001 | | |

Source: data processed by the author, 2025

It is known that the f-statistic value is 20.19790 with a probability statistic value of 0.000011 <0.05, so it can be concluded that the variables of the amount of money in circulation, interest rates and exchange rates together have an effect on inflation.

**Coefficient of Determination Test (R2)**

The coefficient of determination ($R^2$) essentially measures the model's ability to explain variations in the independent variable, as seen from the adjusted $R^2$ value. The greater the adjusted $R^2$, the more dominant the independent variable's influence on the dependent variable. The following results are obtained from the coefficient of determination analysis:

Table 8 Results of the Determination Coefficient Test

| Adjusted R-squared |
|---|
| 0.751938 |

*Source: data processed by the author, 2025*

The Adjusted R-square value is 0.751938, so it can be concluded that the money supply (X1), interest rate (X2), and exchange rate (X3) variables are able to explain the inflation variable (Y) by 75%. While the remaining 25% is influenced by factors not examined by the researcher, such as household consumption, economic growth (output gap), minimum wages, and government policies (fiscal and subsidies).

**CONCLUSION**

Based on the results of the analysis and discussion of research on the influence of the amount of money in circulation, interest rates and exchange rates that have been carried out, the following conclusions can be drawn:

1.The amount of money in circulation has a positive and significant effect on inflation in Indonesia for the period 2005 - 2024. Because the increase in the amount of money circulating in the community for transactions depends on the price level

of goods and services available, it will encourage an increase in the amount of money demanded by the community.

2.Interest rates have a significant influence and have a negative relationship with inflation in Indonesia for the period 2005 - 2024. So the government must implement monetary policy to maintain the fluctuations in interest rates so that they remain stable and inflation does not occur again.

3.The exchange rate has a positive and significant effect on inflation in Indonesia for the period 2005 – 2024. Therefore, the increase or decrease in the rupiah exchange rate does not affect inflation, but we must still pay attention to the rise and fall of the exchange rate so that the increase in the exchange rate does not cause inflation.

4.The relationship between the money supply, interest rates, and exchange rates on inflation in Indonesia from 2005 to 2024. These three variables interact with each other and simultaneously influence the rate of inflation in Indonesia. Therefore, inflation control policies must take all these variables into account in an integrated manner to ensure effective and sustainable results.

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