

Analysis the Influence of Interest Rates on Inflation Rate Developments

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Abstract . Inflation is an increase in the overall prices of goods and services that occurs continuously. The aim of this research is to analyze the influence of interest rates on the development of the inflation rate. Interest rates are one of the monetary policy instruments used by central banks to control inflation. Inflation is an indicator that reflects economic health and influences various aspects such as purchasing power, monetary policy and economic stability. This research examines the effect of changes in interest rates as the main monetary policy instrument used to control inflation and its impact on economic growth. The method used in this research is simple linear regression to analyze the data. The research results show that the coefficient of determination (R^2) is 0.169. This means that around 16.9% of the Inflation variable (Y) is influenced by the independent variable, namely Interest Rates (X). Researchers found that in determining monetary policy the central bank has two quick decision options to control the stability of the inflation rate, including, increasing interest rates when the inflation rate is high or reducing interest rates when the inflation rate is decreasing which results in sluggish economic activity.

Keywords: Implications, Inflation, Interest Rates, Macroeconomics

INTRODUCTION

According to the Bank of Indonesia, inflation is a continuous and comprehensive rise in the price of goods and services. The rise in the price of a commodity or service that spreads and affects the rise of the prices of other commodities can also be interpreted as inflation. Inflation can be caused by a variety of factors, among others, increased public consumption, excess liquidity in markets that trigger consumer or even speculation, and the presence of smooth distribution of goods. (Samudra & Widyawati, 2018). According to Rosa et al (2019), inflation occurs as a result of increased aggregate demand pull inflation and increased cost push inflation, so in this case changes in demand affect price levels where demand is greater than supply. Consumer behaviour in general, business activity in general and changes in overall economic activity both within the scope of a country and the global economy also influence inflation. (Hasyim, 2023).

In the context of macroeconomics, one of the focuses of discussion is economic growth, where inflation is an indicator. Issues related to inflation are very important because the resulting impact can affect Indonesia's economic growth in the long run. Uncontrolled inflation rates can be one of the causes of a country's economic collapse, so the balance of

inflation must be kept stable. In an effort to control inflation, there are other aspects of the macro economy that also play a role. Interest rates are one of the macroeconomic aspects used as an instrument to control inflation and a tool for monetary policy decisions by the central bank. Seeing the relationship between interest rates and inflation rates, it is important to calculate the effect of interest rates on inflation and review the development of inflation as well as its effect on the Indonesian economy.

This study aims to determine the development of the inflation rate in Indonesia for the last 6 years from April 2018 to March 2024. Then an analysis will be carried out regarding the effect of the inflation rate on the economy in Indonesia through a macroeconomic context approach to interest rates, the causes of the increase and decrease in the inflation rate, and the effect of inflation on the determination of interest rate policy, as well as the implications of inflation.

RESEARCH METHODS

This research was conducted in April 2024 using a quantitative-descriptive method that aims to explain the development and implications caused by inflation in Indonesia. This research uses literature review techniques and uses the Simple Linear Regression method, which is a systematic method by identifying several previous studies to analyze existing knowledge related to the topic to be studied. This research data collection technique uses literature studies, namely articles, theses, and scientific journals related to the topics raised in the research. Sources are obtained from scientific journals whose citations come from Google Scholar and other online sites.

Linear regression analysis is a statistical technique in modeling and studying the relationship of two or more variables. Simple linear regression is the simplest and most commonly used linear method in data collection techniques. There are one or more independent or free variables in regression analysis which can be symbolized by the letter X and there is one dependent variable which is generally symbolized by the letter Y. Multiple linear regression analysis is a linear relationship with two or more independent variables ($X_1, X_2, \dots, X_n$) dependent variable (Y).

Linear regression has the following basic equation:

$$Y = a + bx \quad (1)$$

Where:

Y : Forecast value of period t

a : Constant (intercept)

b : Rate of change of the slope of the trend line

x : time index (t=1, 2, 3, ..., n)

n : Number of time periods

In linear regression, there are three components: a as the intersection, b as the slope, and x as the time index. The equation to get the value of a and b is as follows:

$$a = \frac{(\sum y)(\sum x^2) - (\sum x) \sum xy}{n \sum x^2 - (\sum x)^2} \quad (2)$$

$$b = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2} \quad (3)$$

Steps to construct the linear regression method

1. Compile the data to be processed
2. Formation of a linear regression model

The model formation steps are as follows as follows:

1. Step 1: Calculate X^2 , Y^2 , XY and totalize from each.
2. Step 2: Calculate a using the second equation and b using the third equation.
3. Step 3: Model the Simple Linear Regression Equation.
4. Step 4: Forecast the Causal Variable or Resulting Variable.
5. Step 5: Implement the calculation results.

RESULTS AND DISCUSSION

Development of Inflation and Interest Rates in Indonesia

Suseno and Astiyah (2009) say that inflation is the tendency of increasing prices of goods and services in general and continuously. According to Budiono (2008: 155) inflation is a process of increasing the general price of goods continuously. Meanwhile, Sukirno (2008: 14) defines inflation as the process of rising prices which prevails in an economy. If the definition of inflation is elaborated, we can conclude that inflation is a tendency to increase the general price of goods that occurs continuously. Interest rates and forecasts of their future values are one of the important inputs in investment decisions (Bodie et al., 2008: 180). The following table shows the development of inflation rates and interest rates in Indonesia over the last 6 (six) years.

Table 1. Development of inflation and interest rates in Indonesia

No	Year	Month	Total Inflation	Total Interest Rate
1.	2018	April - June	3,25%	4,75 %
		July - September	3,09%	5,5 %
		October - December	3,17%	5,92 %
2.	2019	January - March	2,62%	6 %
		April - June	3,14%	6 %
		July - September	3,40%	5,5 %
		October - December	2,93%	5 %
3.	2020	January - March	2,87%	4,75 %
		April - June	2,27%	4,42 %
		July - September	1,43%	4 %
		October - December	1,57%	3,83 %
4.	2021	January - March	1,43%	3,58 %
		April - June	1,48%	3,5 %
		July - September	1,57%	3,5 %
		October - December	1,76%	3,5 %
5.	2022	January - March	2,29%	3,5 %
		April - June	3,79%	3,5 %
		July - September	5,19%	3,83 %
		October - December	5,17%	5,16 %

6.	2023	January - March	5,24%	5,57 %
		April - June	3,93%	5,75 %
		July - September	2,88%	5,75 %
		October - December	2,68%	6 %
7.	2024	January - March	2,79%	6 %

Source: Bank Indonesia and Central Statistics Agency, 2024 (processed)

Correlation and Determination Test

The coefficient of determination (R^2) in simple linear regression is used to measure how much the contribution of independent variables, such as interest rates (X), to the dependent variable, namely Indonesian inflation (Y). The coefficient of determination used is R^2 . The results of the calculation of the R^2 value using SPSS V.21 are shown in the R Square Column table below.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.411 ^a	.169	.131	.0107089

a. Predictors: (Constant), Suku Bunga

The results of the table above show that the coefficient of determination (R^2) is 0.169. This means that 16.9% of the variation in the Indonesian Inflation variable (Y) can be explained by the independent variable, namely the Interest Rate (X). Meanwhile, 83.1% of other variations are influenced by factors outside the study.

Simultaneous Test (F Test)

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.001	1	.001	4.461	.046 ^b
	Residual	.003	22	.000		
	Total	.003	23			

a. Dependent Variable: Inflasi

b. Predictors: (Constant), Suku Bunga

Based on the table above, the significance value of F (0.046) < 0.05 and F count of 4.461 > F table 4.28. Therefore, the result of the regression analysis model can be considered significant. In this context, we can conclude that the dependent variable (Inflation) can be influenced simultaneously by the independent variable, namely Interest Rate (X), and this variable is feasible to use as a hypothesis of influence on the dependent variable.

Partial Test (t Test)

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	.007	.011		.546
	Suku Bunga	.470	.222	.411	.046

a. Dependent Variable: Inflasi

Based on the table above, the significance value of t (0.046) < 0.05 and t count of 2.112 > t table 2.074. Therefore, the results of the regression analysis model show that the dependent variable (Inflation) is simultaneously influenced by the independent variable, namely the Interest Rate (X). The regression equation used is as follows:

$$Y=a+bX$$

$$Y=0,007+0,470X$$

In the equation, the constant value (a) for the Inflation variable is 0.007, and the regression coefficient (b) for the Interest Rate variable (X) shows that every 1% increase in the Interest Rate value will lead to an increase of 0.470 in the Inflation value. In addition, the direction of the effect of variable X on variable Y is positive because the regression coefficient value is positive.

Analysis of the Causes of Inflation

From the regression calculation above, it can be seen that 16.9% of inflation is influenced by interest rates while 83.1% is influenced by other variables such as poverty rate, economic growth, currency value and so on. The effect of lower interest rates can lead to an increase in the inflation rate due to an increase in aggregate demand caused by higher consumption and investment, as well as an increase in export and asset prices that cause inflationary pressures. When demand for goods and services increases faster than supply, prices tend to rise leading to higher inflation. In general, lower interest rates aim to stimulate the

economy by increasing consumption and investment, which in the long run can lead to higher inflation. With lower interest rates, people tend to reduce their savings and tend to spend the money which results in increased aggregate demand as a contributing factor to inflation. Decreasing interest rates can also lead to currency depreciation, with a weakening domestic currency making imports more expensive and exports cheaper so the increase in import prices can contribute to inflation.

The Influence of Inflation on Determining Interest Rate Policy

The central bank has full authority in setting interest rates. In this case, monetary policy is an essential key to controlling interest rates and inflation levels in a country's economy as a whole. Efforts to control the overall money circulating in the economy are the main focus. The central bank can issue policies by carrying out open market operations, setting discount interest rates, deciding on changes to minimum bank reserves, and giving moral appeals to commercial banks (Prawoto, 2019). Determining the interest rate policy decisions taken must look at the conditions and magnitude of the inflation rate that is occurring. Inflation and interest rates have an inverse relationship or can be interpreted in the sense that when interest rates increase, the inflation rate will decrease (vice versa). This becomes a reference in determining interest rate policy.

Data on the development of inflation rates and interest rates in Table 1 shows that every increase in interest rates will result in a percentage inflation rate that tends to be low and data on high inflation rates shows a low percentage interest rate. Thus, in determining monetary policy the central bank has two decision options to control the stability of the inflation rate, including, increasing interest rates when the inflation rate is high or reducing interest rates when the inflation rate is decreasing, resulting in sluggish economic activity. Currently, Bank Indonesia has an initial effort to control inflation by establishing an inflation targeting framework (ITF), namely in the form of determining the interest rate (BI-Rate) at the beginning of each month.

Implications of Inflation

High inflation and increases in prices of goods and services in general and continuously over a certain period of time can be an economic problem because they can cause various negative impacts, including:

1. Reduce people's purchasing power. When the prices of goods and services increase, people are forced to spend more money to buy the same goods and services. This can

result in a decrease in purchasing power, making it difficult for people to meet their needs properly.

2. Increase production costs. Rising prices of raw materials and labor can lead to increased production costs. This can make goods and services more expensive, which in turn can increase inflation.
3. Reduce interest in saving. When inflation is high, the value of money held in savings decreases. This can reduce people's desire to save, so that economic growth can be hampered.
4. Damaging the economic structure. High inflation can cause price instability in the market, which can affect investment and business decisions by companies, thereby reducing economic growth.
5. Increasing economic uncertainty. High inflation can make people unsure about future economic conditions, hamper economic activity, and ultimately reduce economic growth.

As a result of inflation, prices will also increase which will encourage entrepreneurs to increase their production. However, if price increases or inflation are too high, this will have a negative impact on the economy. Inflation that is too high will make people who were previously able to meet their daily needs no longer able to meet their needs as before (Salim et al., 2021).

CONCLUSION

Based on the discussion above, it can be concluded that:

1. Inflation is an overall increase in prices that occurs continuously, and has a significant impact on various economic aspects such as people's purchasing power, monetary policy, and economic stability.
2. Interest rates are one of the main monetary policy tools used to control inflation. The inflation rate and interest rates have a mutually influencing relationship, where an increase in interest rates tends to reduce the inflation rate, and vice versa.
3. The central bank has an important role in setting interest rate policies to control inflation and maintain overall economic stability.
4. The implications of high inflation include a decrease in people's purchasing power, an increase in production costs, and a reduction in people's interest in saving.

Thus, a deep understanding of the relationship between inflation, interest rates and monetary policy is very important in maintaining economic stability and economic growth in

a country. Efforts to control inflation and manage interest rates appropriately can help create a healthy and sustainable economic environment.

SUGGESTION

1. The central bank needs to continue to monitor and control the inflation rate wisely through monetary policy, including setting interest rates.
2. Further analysis needs to be carried out regarding other factors that influence inflation in Indonesia, such as poverty levels and economic growth.
3. Increasing people's economic literacy can help them understand the impact of inflation and manage finances more wisely.

Thus, a deep understanding of the relationship between inflation, interest rates and other factors can help in formulating more effective and sustainable economic policies to support Indonesia's economic growth.

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