

Analysis of The Influence of Food Prices on Inflation in Sumenep Regency in 2020-2023

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Abstract

Food prices are one of the main factors that affect inflation. Rising food prices can have a significant impact on inflation, especially in developing countries such as Indonesia. This study aims to see the influence of food prices such as rice, eggs, chicken meat, oil, onions, LPG gas, urea fertilizer on inflation in Sumenep Regency. The method chosen in this study is a qualitative method using time series data regression analysis techniques from the period January 2020 to December 2023. The results of this study show that the price of rice and LPG gas has a negative influence on inflation, while the price of chicken meat, oil, onion, and urea fertilizer has a positive influence. Meanwhile, eggs have no effect on the inflation rate in Sumenep Regency. Keywords: Food Prices, Inflation, Regression.

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1. Introduction

Inflation is a situation in which the price of goods increases continuously. The inflation rate is one of the important economic indicators in the economic system where all developing countries always strive to keep the inflation rate at a low and stable level (Faradilla et al, 2021). Inflation can be caused by several things, namely the amount of demand for goods and services that exceed the number of offers of these goods and services, the rupiah exchange rate, international commodity prices, a decrease in the number of goods offered and the amount of money supply.

Basic human needs include clothing, food, and board. Along with the times, human needs will vary. Food is a basic necessity that is very important for survival. Food prices in Indonesia often change and are unstable. Rice, corn, soybeans, wheat flour, sugar, cooking oil, onions, chili, eggs, meat, and milk are commodities that are of concern because their prices often change (Sumaryanto, 2009).

Inflation is grouped into different types. Inflation that is influenced by the food group is called *Volatile Food*. According to Bank Indonesia, shocks in the foodstuff group such as harvests, natural disturbances, or factors in the development of domestic and international food commodity prices are the main causes of inflation. Volatile component inflation, also known as volatile food, is the most dominant inflation. Food prices are one of the main factors that affect inflation. Rising food prices can have a significant impact on inflation, especially in developing countries such as Indonesia. Inflation causes the prices of goods and services to rise over time, which in turn reduces the purchasing power of money. Consumers have to pay more money to get the same goods and services. The increase in food prices will increase people's living costs, especially for those with low incomes. This can lead to a decrease in people's purchasing power and worsen poverty. Food is an important component of the Consumer Price Index (CPI), which is used to measure inflation. A significant increase in food prices will drive inflation. Food commodities such as rice, eggs, cooking oil, and chili peppers are commodities that are often highlighted and are basic needs for all people, especially the middle and lower classes

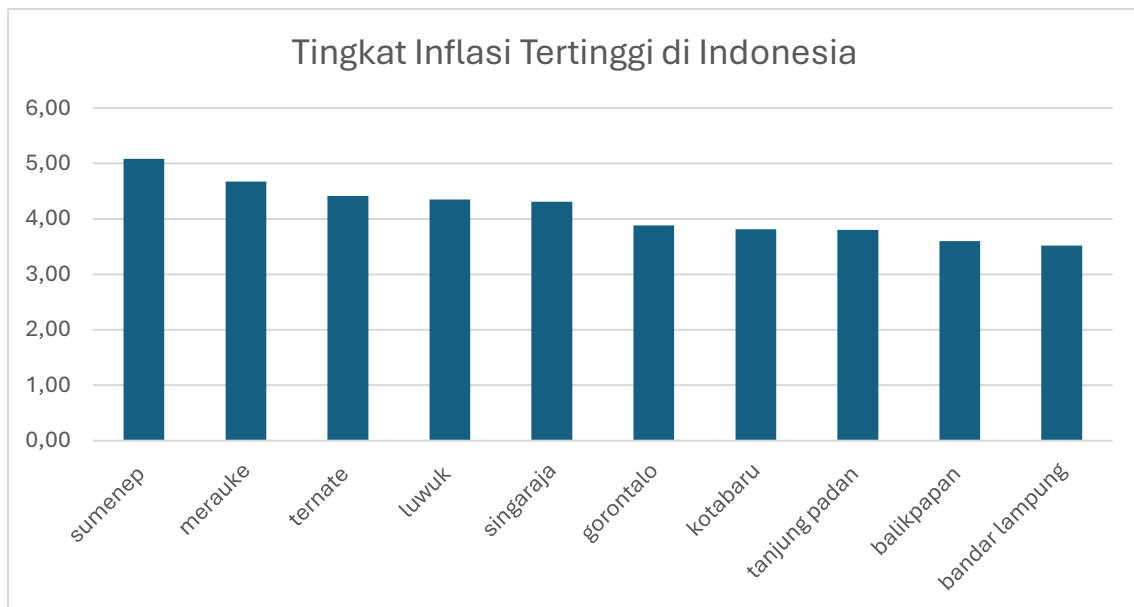


Figure 1. Data on the Highest Inflation Rate in Indonesia

Source: BPS, data processed

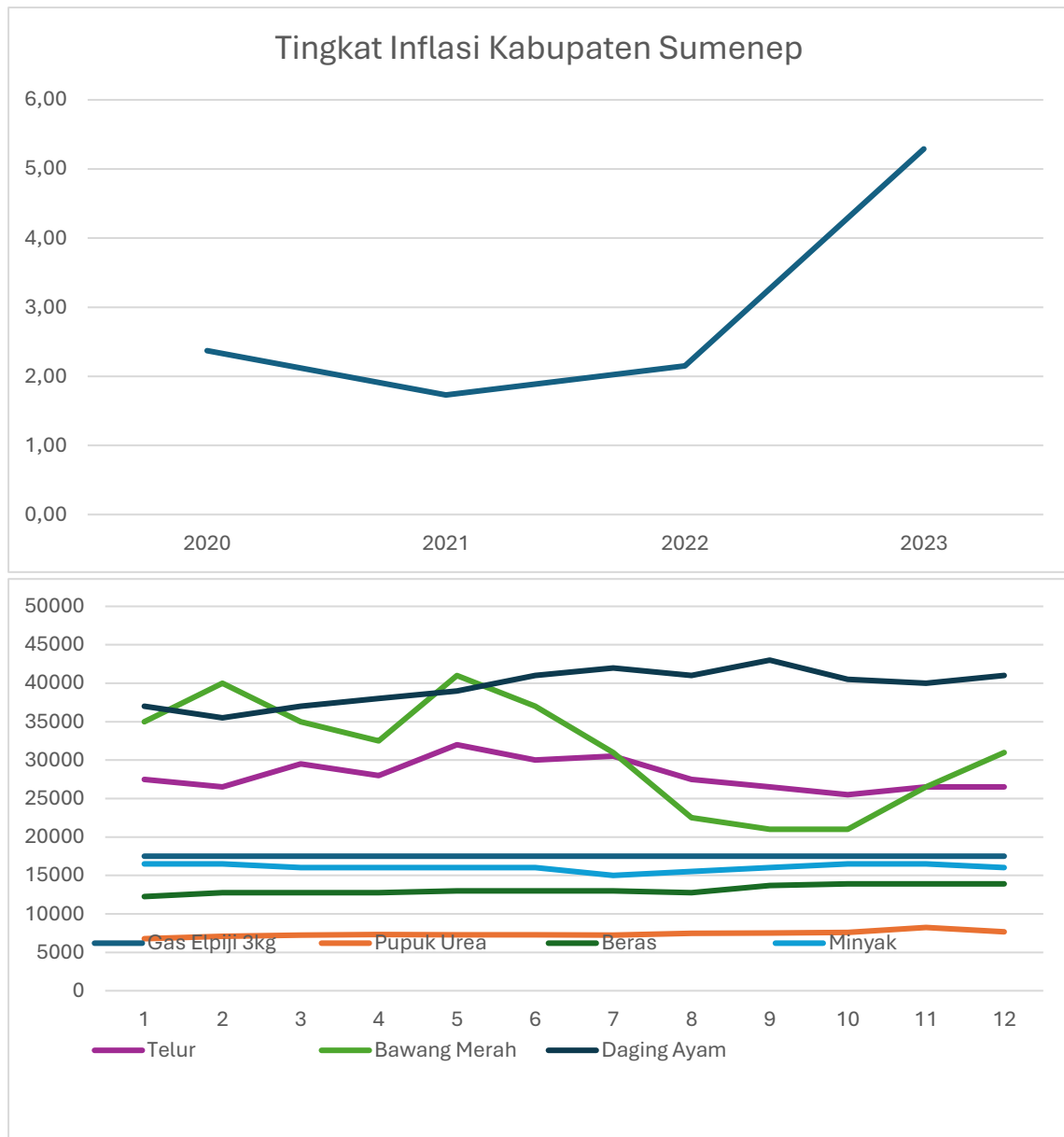


Figure 2. Inflation Rate in Sumenep Regency, 2023

Source: BPS data processed

According to the Central Statistics Agency (BPS), Sumenep Regency will be the district with the highest inflation rate in Indonesia at the end of 2023, which is 5.29%. In 2020, inflation in Sumenep Regency was recorded at 2.37%, then dropped to 1.73% in 2021, and rose again to 2.15% in 2022.

Based on the graph above, it can be seen that the prices of food and non-food commodities fluctuate throughout 2023. Food commodities such as chicken, eggs, and shallots showed the most significant fluctuations, with considerable price increases and decreases. Meanwhile, the price of non-food commodities such as LPG gas and urea fertilizer fluctuates quite steadily.

The significant increase in food commodity prices in Sumenep Regency is due to an increase in public consumption, this is because food commodities such as chicken, eggs, rice, onions, and oil are daily staples. So this is one of the main aspects of inflation. In addition to food commodities, there are non-food commodities that affect the inflation rate in Sumenep Regency such as LPG gas and urea fertilizer. LPG gas is a basic need needed by the community so that price fluctuations can affect inflation. On the other hand, the agricultural sector is the main sector of people's livelihoods in Sumenep Regency so that the increase in fertilizer prices can also affect the inflation rate in the area.

Research conducted by Chintia & Destiningsih (2022) said that Semarang City's inflation was significantly influenced by the price of rice and purebred chicken meat. Similar research was also

conducted by Achievement (2022) which states that the price of red chili, cayenne pepper, onion, garlic, chicken meat and purebred eggs affects inflation in Riau Province in the short term, while the price of purebred chicken meat and eggs affects inflation in Riau Province in the long term. Research conducted by Helbawanti, et al. (2021) stating that foodstuffs such as rice, beef, cooking oil, onions, and rice have a significant effect with the direction of a negative coefficient on inflation, which means that the movement of food prices tends to be deflationary. Foodstuffs such as garlic, chicken meat, and granulated sugar have a positive effect on increasing inflation.

This study aims to see the influence of food prices on inflation in Sumenep Regency. Food and non-food are daily needs of the community that are urgently needed. The community will buy everything they need to support their daily lives. The price of food and non-food affects the level of people's purchasing power. When food prices are low, people's purchasing power levels will increase, while when food prices increase, people's purchasing power levels will be low. Theoretically, this study provides benefits regarding the effect of food prices consisting of rice, eggs, cooking oil and chili peppers on inflation. In addition, this study is expected to be used as information for further research related to the impact of food prices on inflation.

1.1. Theory Keynes

Macro theory is the basis of Keynes' theory of inflation. Inflation occurs because people want to spend more money than they can afford. This means that when people can turn their desires into effective demand for goods, there is an inflation gap. The cause of inflation in the economy is said to be the flow gap because consumers are able to convert their desires into effective demand for goods. Inflation will not stop happening until the effective demand of the people remains higher than the productive capacity of the people. If total effective demand did not exceed the price of the quantity of available output, according to Keynes, inflation would not occur.

1.2. Theory Structuralis

Based on the experience of Latin American countries, structuralist inflation theory emphasizes the rigidity or inflexibility of the economic structures of developing countries. According to this theory, according to Boediono (1995 in Santosa, 2017), there are two main problems in the economies of developing countries that can cause inflation. The first reason is the inelasticity of export earnings, which means that the growth of export value is slower than other sectors. The second reason is that the supply of domestic food production is inelastic. Domestic food prices tend to continue to increase faster than non-food prices because the increase in domestic food production is not in line with population and per capita growth.

2. Method

2.1. Data Types and Sources

The type of study used was quantitative and used multiple linear regression analysis as a secondary data source. Secondary data consists of the price of foodstuffs, such as rice, eggs, cooking oil, chili, and inflation; The price of foodstuffs is measured in Rupiah per kilogram, and inflation is measured in percent.

The source used is secondary data where this data is data taken indirectly or not with the first hand, but from the institution or agency that disseminates it. East Java Siskaperbapo is the source of secondary data collection in this study with a time range of January 2020 to December 2023.

2.2. Data Analysis Model

An analysis method known as multiple linear regression is used to calculate the relationship between independent variables that are more than one (X) and bound variables (Y). Where the free variables consist of the price of rice, eggs, cooking oil, and chili. The key for the bound variable is inflation. Data analysis using evIEWS software 12.

The multiple linear regression model in the analysis of food prices against inflation is:

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + \varepsilon$$

Information:

Y	: Inflation
a	: <i>Constant</i>
β (1, 2, 3, 4, 5, 6, 7)	: Regression coefficient of each <i>independent variable</i>
t	: Time
X1	: Rice
X2	: Eggs
X3	: Chicken Meat
X4	: Oil
X5	: Shallots
X6	: LPG Gas
X7	: Pupuk Urea
ε	: <i>error term</i>

3. Results and Discussion

3.1. Result

3.1.1. Classic Assumption Test

Table 1. Multicollinearity Test

Variable	Centered VIF
Rice	8.011817
Chicken Meat	1.353713
Shallot	1.591802
Egg	3.049533
Oil	1.641958
LPG Gas 3kg	4.822356
Urea Fertilizer	12.72003

Judging from the results of the calculation above, it is known that the variable VIF value of Urea Fertilizer is 12.72003 greater than 10, meaning that there is a multicollinearity problem. Meanwhile, the other variables, namely rice, meat, chicken, onion, eggs, oil, and LPG gas, have a VIF value below 10, so there are no problems in multicollinearity.

3.1.2. Heterogeneity Test

Table 2. Heteroskedasticity Test: White

F-statistic	2.159619	Prob. F(34,13)	0.0695
Obs*R-squared	40.78004	Prob. Chi-Square(34)	0.1969
Scaled explained SS	36.82093	Prob. Chi-Square(34)	0.3396

Judging from the results of the above test, the probability value of Chi square of 0.1969 is smaller than the significance level of 0.05, so there is no heterogeneity problem

3.1.3. Autocorrelation Test

Table 3. Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	3.227933	Prob. F(2,38)	0.0507
Obs*R-squared	6.970544	Prob. Chi-Square(2)	0.0306

Based on the results of the autocorrelation test with the Breusch-Godfrey test model, the Chi-square probability value of 0.0306 is smaller than the significance level of 0.05, which means that there is a problem in autocorrelation.

3.1.4. Statistical Test

Table 4. Statistical Test

VARIABEL	Adj. R-Square	F-Test		Coefficient	T-Test	
		F Statistics	Prob. (F state)		Prob. T-stat	Significance
Rice	0.861780	42.86263	0.00000	-0.000755	0.0462	0.005
Chicken Meat				-6.70E-05	0.0472	0.005
Shallot				4.66E-05	0.0036	0.005
Egg				-2.59E-05	0.6353	0.005
Oil				0.000120	0.0181	0.005
LPG Gas				-0.005539	0.0000	0.005
Urea Fertilizer				0.000603	0.0417	0.005

3.1.5. T test

- 1) Judging from the regression processing in the table, the calculated t-magnitude is $-2.057 > 1.684$, and the t-test probability is 0.0462 less than the magnitude of the significance level $\alpha = 5\%$ (0.05). The result was that H_0 was rejected and H_1 was accepted, which illustrates that the rice price variable (X_1) has a significant effect on inflation in Sumenep Regency.
- 2) Judging from the regression processing in the table, the t-magnitude of the calculation is $-0.4779 < 1.684$, and the probability of the t-test is 0.63 more than the magnitude of the significance level $\alpha = 5\%$ (0.05). The result was that H_0 was accepted and H_1 was rejected, which illustrates that the egg price variable (X_2) has no significant impact on inflation in Sumenep Regency.
- 3) Judging from the regression processing in the table, the calculated t-magnitude is $-2.047868 < 1.684$, and the t-test probability is 0.0472 less than the significance level of $\alpha = 5\%$ (0.05). The result was that H_0 was rejected and H_1 was accepted, which illustrates that the variable price of chicken meat (X_3) has a significant effect on inflation in Sumenep Regency.
- 4) Judging from the regression processing in the table, the calculated t-magnitude is $3.092673 > 1.684$, and the t-test probability is 0.0036 less than the significance level of $\alpha = 5\%$ (0.05). The result was that H_0 was rejected and H_1 was accepted, which illustrates that the variable price of shallots (X_4) has a significant effect on inflation in Sumenep Regency.
- 5) Judging from the regression processing in the table, the calculated t-magnitude is $2.464346 < 1.684$, and the t-test probability is 0.0181 less than the magnitude of the significance level $\alpha = 5\%$ (0.05). The result was that H_0 was rejected and H_1 was accepted, which illustrates that the oil price variable (X_5) has a significant effect on inflation in Sumenep Regency.
- 6) Judging from the regression processing in the table, the t-magnitude of the calculation is $-6.441641 < 1.684$, and the probability of the t-test is 0.0000 less than the magnitude of the significance level of $\alpha = 5\%$ (0.05). The result was that H_0 was rejected and H_1 was accepted, which illustrates that the LPG price variable (X_6) has a significant effect on inflation in Sumenep Regency.
- 7) Judging from the regression processing in the table, the calculated t-magnitude is $2.103959 < 1.684$, and the t-test probability is 0.0417 less than the magnitude of the significance level $\alpha = 5\%$ (0.05). The result was that H_0 was rejected and H_1 was accepted, which illustrates that the variable price of urea fertilizer (X_7) has a significant effect on inflation in Sumenep Regency.

3.1.6. Test F

Judging from the regression results in the table, it shows that the probability value of the F test of 0.000000 is smaller than the significance level value of $\alpha = 5\%$ (0.05). This condition illustrates that H_0 is rejected and H_1 is accepted, which means that independent variables in the price of rice, eggs, chicken meat, onions, oil, LPG gas and fertilizer have an impact on inflation in Sumenep Regency

3.1.7. Coefficient of Determination Test (R^2)

The regression results illustrate that the magnitude of the R^2 determination coefficient of 0.86 illustrates that the inflation-bound variable in Sumenep Regency is represented by 86% by the prices of rice, eggs, chicken meat, onions, oil, LPG gas and fertilizer while the remaining 14% is represented by variables outside the model.

3.2. Discussion

Based on the results of regression analysis, the commodities that have the most influence on inflation in Ka Regency are gas, onions, oil, fertilizers, rice, and chicken. With a probability value of gas of 0.000, shallots of 0.0036, oil of 0.018, fertilizer of 0.0417, rice of 0.462, and chicken meat of 0.0472. while eggs have no effect on inflation in Sumenep Regency.

3kg LPG gas is the commodity that has the most influence on inflation in Sumenep Regency. LPG gas has a negative influence on the inflation rate. This is not in line with Keynes' theory or structuralist theory. This is because when the inflation rate in Sumenep Regency tends to rise, but the price of LPG will remain stable or decrease, this is because 3 kg of LPG gas is a government-subsidized item so that the increase or decrease follows the national market.

The next commodity that has the second biggest influence is shallots. Shallots have a positive influence on inflation so that when inflation rises, the price of shallots will also rise. This is because shallots are one of the main ingredients used for cooking, causing a high demand for this commodity. In addition, there are no substitute goods from the shallots themselves when the demand increases and the market is unable to meet the needs of these goods, it will cause a price spike that triggers inflation in Sumenep Regency. This is in accordance with Keynes' theory of inflation where inflation occurs when the amount of demand exceeds the amount of output available in the market. The results of this study are in accordance with the research Andira (2020) that the price of shallots has a positive and significant effect on inflation in Temanggung Regency.

The third commodity that has the most impact on inflation in Sumenep Regency is cooking oil. Cooking oil has a positive influence on inflation, when inflation tends to rise, the price of oil commodities will also increase. This is because every household or food industry certainly needs oil as a raw material to make processed food, this causes a high demand for cooking oil. Therefore, the increase in cooking oil prices will cause inflation in Sumenep Regency. This is in accordance with Keynes' theory of the cause of inflation, where inflation is caused by an increase in demand and an increase in prices.

The next commodity that has an impact on inflation in Sumenep Regency is fertilizer. This is because most of the livelihood of the people of Sumenep Regency is farmers, causing a high demand for fertilizer in the district. fertilizer prices have a positive influence on inflation in Sumenep Regency. Where the increase in fertilizer prices will also cause an increase in inflation. The commodities that further affect inflation in Sumenep Regency are rice and chicken, these commodities have a negative and very small influence on inflation in Sumenep Regency with probability values of 0.0462 and 0.0472 respectively. This is because even though rice is a daily staple and the demand for this commodity is high, this can be balanced with the availability of raw materials. In addition, there are still substitute goods from baras and chicken meat commodities. This condition is in accordance with research conducted by Chintia and Destiningsih (2022) that rice has a small influence in contributing to inflation in Semarang City.

1) The Effect of Rice Prices on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that there is an influence of rice prices on inflation. It can be seen from the results of the regression analysis that the tCal Value = (-2.057) with a Significance Value (sig) = 0.0462 < 0.05 which means that the price of rice has a negative influence on inflation.

This is in line with research conducted by Widiarsih (2012) That rice has a negative influence on inflation in the short term. This is because when inflation increases, the government through Bulog will issue policies to reduce prices so that the price of rice will fall.

2) The Effect of Egg Prices on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that egg prices have no effect on inflation. It can be seen from the results of the regression analysis that the value of tCal = (-0.4779) with a Significance Value (sig) = 0.63 > 0.05 which means that egg prices do not have a negative influence on inflation. This is influenced by several factors, including that eggs are a food ingredient that is not often consumed by the public.

3) The Effect of Chicken Meat Prices on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that the price of chicken meat has an impact on inflation. It can be seen from the results of the regression analysis that the tCal Value = (-2.047868) with a Significance Value (sig) = 0.0472 < 0.05 which means that the price of chicken meat has a negative influence on inflation. When the price of chicken meat rises, it will reduce inflation.

4) The Effect of Oil Prices on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that oil prices have an influence on inflation. It can be seen from the results of the regression analysis that the tCal Value = (2.464346) with a Significance Value (sig) = 0.0181 < 0.05 which means that oil prices have a positive influence on inflation.

5) The Effect of Shallot Prices on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that the price of shallots has an influence on inflation. It can be seen from the results of the regression analysis that the value of tCal = (3.092673) with a significance value (sig) = 0.0036 < 0.05 which means that the price of shallots has a positive effect on inflation. When the price of shallots rises, it will increase the inflation rate.

6) The Effect of LPG Prices on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that the price of LPG gas has an influence on inflation. It can be seen from the results of the regression analysis that the value of tCal = (-6.441641) with a significance value (sig) = 0.0000 < 0.05 which means that the price of LPG gas has a negative influence on inflation.

7) The Effect of Urea Fertilizer Price on Inflation in Sumenep Regency

The results carried out using the help of Eviews 12 software show that the price of urea fertilizer has an influence on inflation. It can be seen from the results of the regression analysis that the value of tCal = (2.103959) with a significance value (sig) = 0.0417 < 0.05 which means that the price of urea fertilizer has a positive influence on inflation. When the price of fertilizer increases, it will cause inflation to increase.

4. Conclusion

The results of the analysis using the Eviews 12 software on the impact of the prices of several goods on the inflation rate in Sumenep Regency show that the prices of rice, chicken meat, oil, onions, LPG gas, and urea fertilizer have a significant influence on the inflation rate. The price of rice and LPG gas tends to have a negative influence on inflation, while the price of chicken meat, oil, onion, and urea fertilizer has a positive influence. These results are consistent with previous research that highlighted the important role these factors play in determining inflation rates in the region. However, there is no significant effect of egg prices on inflation, which may be influenced by other factors that affect people's egg consumption. Therefore, understanding the price dynamics of these goods can be the basis for inflation control policies in Sumenep Regency.

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