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Rice Price Ceiling (HET) regulation's effect toward rice's inflation rate in South Sulawesi

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Abstract. This study discusses to analyze the highest retail price policy for rice retailers released by the Minister of Trade in September 2017 against the rate of rice sales, in South Sulawesi Province. This study used three cities that were considered to represent South Sulawesi in a comparative calculation: Makassar City, Pare-pare City and Bone District. All variables are analyzed using Multiple Linear Regression. These variables are rice stocks, rice price margins, real exchange rates, and exchange rates of each region. Data is taken from April 2016 to December 2018 and uses calculated from month to month. The conclusion. This is evidenced by 4 of the six equations that are agreed by the dummy variable value of each equation. Therefore, the government must return this policy to reach a level that can be entered below the expected target.

1. Introduction

Inflation is an economic phenomenon that is still the focus of the government in Indonesia today. Hera et al. [1] mentioned it as an impact of growth on the aggregate macroeconomy: economic growth, competitiveness, productivity and even income distribution. The target output determined by the government is inseparable from the government's goal in becoming economic stability in Indonesia. One of them, one of which is the price of rice. Rice prices are special because rice is still the main agricultural commodity and staple food of the Indonesian people. The consumption of the Indonesian people towards rice reaches 114.6 kg per capita per year.

The price of rice is inelastic. This causes the commodity to be vulnerable to inflation. Apart from the amount of consumption per capita per year, the supply of rice is usually often disrupted mainly due to uncertain weather. According to Widiarsih [2] politically explaining the value of rice means that the availability of supply and a surge in prices will have an impact on political stability. When the turmoil cannot be appropriately overcome, it can impact the political sphere. Thus, the availability and security of rice prices are one of the keys to achieving national stability, especially economic stability.

The form of government policy is to realize a basic price policy by using the applicable instrument price (base price) and maximum price (the highest price). The basic pricing policy is set by the government purchase price policy, while the maximum price policy is set at the highest retail price (HET) policy. The highest retail price is the highest agreed to change to the price of goods specified in a contract during a trading period by existing trade conditions. Approved market prices are not permitted to raise prices above the specified maximum price [3].



Highest retail price of rice is approved based on ⁶minister of trade regulation No.57/M-DAG/PER/8/2017 concerning determination of the highest retail price of rice. Every region in Indonesia has the highest bid price in selling rice. This regulation applies two types of rice, namely premium and medium rice. The highest retail price in the Sulawesi region is IDR 12,800/Kg for premium type rice and IDR 9,450/kg for medium type rice.

South Sulawesi is known as a local rice producer and one of the leading rice suppliers in Indonesia. However, rice is still one of the bribe commodities in South Sulawesi year-on-year. This is translated from numbers and conversions ⁸in five cities for South Sulawesi: Makassar City, Pare-pare City, Bone Regency, Palopo City, and Bulukumba Regency.

The purpose of this study was to study this significance policy affecting the inflation rate in South Sulawesi. This study took three out of five cities/regencies determined by the Central Bureau of Statistics, namely Makassar City, Pare-pare City, and Bone Regency. The fundamental reason is that these three regions constitute three broad areas in South Sulawesi and rice distribution lines to other regions in Indonesia. The research method used is multiple linear regression with one independent variable and four independent variables.

2. Methods

Sources of data taken in this study come from various sources, which are then called secondary data. These secondary data are received from the central statistics agency, the Indonesian Ministry of Agriculture Food Security Agency, Food and Agriculture Organization (FAO) and Bank Indonesia. Multiple linear ¹regression is an analytical tool used in this study. This analysis is useful in knowing the relationship of independent variables to the dependent variable. The dependent variable used is the year-on-year inflation rate. The independent variables used are rice supply (X1), rice price margin (X2), a Real Exchange Rate (RER) (X3), and dummy variable. The dummy variable aims to identify whether there have been changes after the highest retail price policy was set in September 2017. Thus, the multiple linear regression equation used is as follows.

$$INF_{beras} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 Dummy \quad (1)$$

Information:

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$	= Coefficient of each variable
X1	= Rice supply (Kg)
X2	= Rice price margin (IDR/Kg)
X3	= Real exchange rate (ratio)
Dummy	= Variable with a value of 0 (before) and 1 (after)

The above equation is an equation that uses different units of each variable. Therefore according to Gujarati [4] the selection of this equation model is based on the use of the natural logarithmic model (Ln) which has the advantage of minimizing the possibility of heteroscedasticity. The equation after using natural logarithms as a step to transform data is as follows.

$$INF_{beras} = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 Dummy \quad (2)$$

Based on these equations, the framework of the study is as follows.

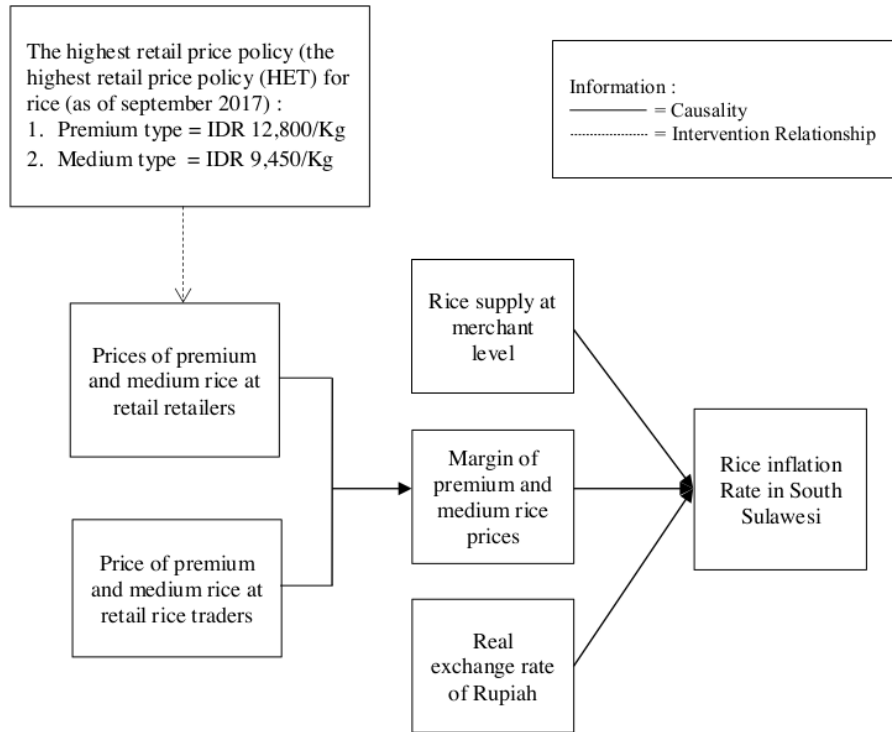


Figure 1. Framework

3. Results and discussion

3.1. Changes in rice price margin, rice supply and real exchange rate

Changes that occur in the three variables need to be seen as a benchmark for conclusions in this study. Rice price margin data are calculated and grouped on average before and after the highest retail price policy was enacted. The average percentage of data is then tested to find out the significance level using the paired sample T-test. Based on the data collected, changes in rice price margins in the three regions are presented in table 1 on the following page.

Table 1. Mean of rice price margin in percentage (%)

Rice price margin	Before implementation HET	After implementation HET	T-Test
Makassar			
• Medium	2.65%	7.04%	0.000*
• Premium	9.62%	12.08%	0.161
Pare-pare			
• Medium	5.94%	5.63%	0.592
• Premium	3.09%	2.56%	0.410
Bone District			
• Medium	3.57%	1.55%	0.000*
• Premium	3.91%	4.87%	0.010*

* is a Paired Sample T-test which has a significant value $< \alpha = 0.05$

In table 1, the average percentage is calculated based on the period before and after the determination of highest retail price of rice. A significant T-test value indicates the effect of highest retail price on the increase or decrease in the percentage of rice price margins. These results indicate Makassar City and Bone District with premium types of rice whose rate of price margins increased after the stipulation of highest retail price. According to Azwar [5], this is due to the length of the distribution chain, which causes more significant price differences in Makassar City. As for Bone Regency, the margin for the price of medium type rice has decreased due to better absorption of rice, for medium type rice [6]. The average rice supply in the three research sites is presented in table 2 below.

Table 2. Mean of rice stock in kilogram

Rice stock	Before implementation	After implementation	T-test
Makassar			
• Medium	8769.82	5202.62	0.008*
• Premium	6212.05	5721.31	0.732
Pare-pare			
• Medium	2065.88	775.62	0.002*
• Premium	1273.65	482.19	0.020*
Bone District			
• Medium	2690.60	3528.12	0.174
• Premium	1672.53	3412.50	0.005*

* is a Paired Sample T Test which has a significant value $< \alpha = 0.05$

In table 2 we can see the average supply of rice supplied to the level of traders for each period specified in the table. Rice supply is seen to increase in Bone Regency, both for medium and premium types of rice, this is due to the absorption of rice by Bulog from larger mills and rice production surplus [6]. Whereas in both regions, namely Makassar City and Pare-pare City, according to Susilowati [7] rice supply declined due to deficit rice production and the two areas were the largest share of rice delivery to other regions in Indonesia. The Real Exchange Rate (RER) in the three regions is presented in table 3 below.

Table 3. Mean of rice's real exchange rate.

Real Exchange Rate	Before Implementation	After Implementation	T-test
Makassar			
• Medium	1,94	1,78	0,002*
• Premium	2,27	2,02	0,000*
Pare-pare			
• Medium	1,79	1,55	0,000*
• Premium	2,11	1,88	0,000*
Bone District			
• Medium	1,78	1,55	0,000*
• Premium	2,03	1,89	0,021

* is a Paired Sample T Test which has a significant value $< \alpha = 0.05$

In table 3, the average real exchange rate shows a declining ratio after the determination of the HET policy is set. The rupiah exchange rate in the calculated period and the increase in domestic rice prices are the factors that influence the real exchange rate in 2017. Another factor is the increasing demand for rice from Iran and Bangladesh, which has caused a reduction in rice stocks in various countries such as Thailand, Vietnam and India and impact on international rice prices [8].

3.2. Effect of highest retail price of rice policy on inflation rate in South Sulawesi

The classic assumption test is the first step that must be done to determine the effect of HET rice policy on the inflation rate in South Sulawesi. The results of the six samples in the normality, multicollinearity, heteroscedasticity and autocorrelation tests state that the variables used in the sample are worth estimating.

The next step is to use the R-square test, partial T, and F test to identify the significant influence of each independent variable on the dependent variable. So from the six research results, four of them show a relationship between highest retail price of rice policy setting on the inflation rate. This relationship is assumed by dummy variable. The results of this study can be seen in table 4 on the following page.

Table 4. Effect of highest retail price of rice policy on inflation rate in South Sulawesi.

Regions	Coefficient of each variable						
	β_0	X1	X2	X3	D	F	Adj. R ²
Makassar							
• Medium	-0.175 (0.343)	0.047* (0.015)	0.043* (0.046)	-0.086 (0.575)	-0.001 (0.968)	×	17.3%
• Premium	-0.380* (0.017)	0.035* (0.003)	0.032* (0.005)	0.235 (0.082)	0.046* (0.033)	√	41.00%
Pare-pare							
• Medium	-0.260* (0.021)	0.038* (0.016)	0.018 (0.303)	-0.110 (0.211)	0.052* (0.005)	√	26.80%
• Premium	0.084 (0.351)	0.013 (0.162)	0.024* (0.006)	-0.090 (0.348)	0.033* (0.050)	√	27.70%
Bone District							
• Medium	0.575 (0.076)	-0.021 (0.593)	0.075* (0.010)	-0.276 (0.149)	0.067 (0.055)	√	37.90%
• Premium	1.082* (0.001)	-0.102* (0.001)	0.011 (0.514)	-0.538* (0.008)	0.092* (0.006)	√	49.80%

* is a Paired Sample T Test which has a significant value $< \alpha = 0.05$

In table 4, the linear regression equation that has a significant effect can be seen in the significant value of each variable given in parentheses. The explanations from each region are as follows.

3.2.1. Makassar City. The multiple linear regression equation which simultaneously (F-Test) is significant at a level smaller than $\alpha = 0.05$ is a multiple linear regression equation with a premium type of rice sample. Adjusted R² test for this equation is 41%. This means that the independent variables used in this equation can explain the relationship to the inflation rate of 41%. In addition, 59% (100% - 41% = 59%) were able to be explained by other variables not included in this study. The partial test of each independent variable from this equation is as follows.

- Constanta (β_0). This equation constant is -0.380 and is significant at levels below 0.05. This means that if the other independent variables are ignored, then the inflation rate in Makassar City for premium rice is -0.380%.
- Rice stock (X1). The coefficient of the variable supply of rice is 0.035 and is significant at levels below 0.05. This is not following the study by [9] which states that the coefficient of rice supply should be negative; rice supply has a negative relationship to the inflation rate. That is, if inflation increases if the rice supply is added, then the inflation rate will slow down. However, the results of this study indicate that the level of rice consumption in Makassar City is still higher than the supply of rice available.

- c. Rice margin prices (X2). The margin of the price of rice is 0.032 and is significantly below the 0.05 level. This is following [5], rice prices have an influence on the inflation rate due to the length of the distribution chain so that the price margin will be affected.
- d. Dummy variable. The dummy variable coefficient is 0.046 and is significant at levels below 0.05. If the value of the dummy variable is 1 (describing the situation after the highest retail price of rice policy is set), then the result is a positive dummy policy that has a relationship with the increase in the inflation rate in Makassar City for premium types of rice.

3.2.2. *Pare-pare City*. Multiple linear regression equations with premium types of rice simultaneously significantly (F-Test) significant at smaller than $\alpha = 0.05$. Adjusted R^2 test for the equation with medium type rice is 26.8%. Meanwhile, the adjusted R^2 analysis for the equation with premium type rice is worth 27.7%. Adjusted R^2 percentage explains that the independent variables used in multiple linear regression equations in medium type rice can explain the relationship to the inflation rate of 26.8%. The rest, which is equal to 73.2%, can be explained by other variables not included in this study. Meanwhile, the independent variables used in the multiple linear regression equation on premium rice can explain the relationship to the inflation rate of 27.7%. The rest, which is equal to 72.3%, can be explained by other variables not included in this study. The Partial Test or T-Test for each of the independent variables of this equation is as follows.

- a. *Constanta (β_0)*. The equation for the medium type of rice is -0.260. This shows that if other variables are ignored, then the inflation rate of Pare-pare City for medium type rice is -0.260%. Whereas, the constant for the equation of premium type rice is not significant at the level below than 0.05.
- b. *Rice Stock (X1)*. The variable coefficient of medium rice supply is 0.038 and is significant at levels below 0.05. This is not following the study by [9] which states that the coefficient of rice supply should be negative, rice supply has a negative relationship to speed. Rice assistance in the city of Pare-pare is quite vulnerable to affect the risk of the City of Pare-pare, the largest rice payment in the Province of South Sulawesi [7]. Payment of rice sold in the area is not only for public consumption, but also sent to other regions. Meanwhile, the variable coefficient of rice supply for rice types of the premium is not significant at levels below 0.05.
- c. *Rice Margin Prices (X2)*. The coefficient of margin for rice prices for premium types of rice is 0.024 and is significant at levels below 0.05. This is following the opinion of Ade [10] that price margins are influenced by prices at the level of wholesalers and milling rates. If prices at the grinding level rise, the price of rice in Pare-pare City, especially in Pasar Lakessi, will be affected. Meanwhile, the price margin for rice for medium type rice does not have a significant effect on the inflation rate at the 0.05 level.
- d. *Dummy Variable*. The two multiple linear regression equations show the relationship between the inflation rate and the HET Rice policy setting in Pare-pare City. The dummy variable coefficient for the multiple linear regression equation for medium rice is 0.052. Meanwhile, the dummy variable coefficient for the multiple linear regression equation for premium rice is 0.033. If the value of the dummy variable is 1, then the determination of HET policy positively affects the inflation rate in Pare-pare City in both types of medium and premium rice. This positive relationship can be seen in the positive dummy variable coefficient.

3.2.3. *Bone District*. The multiple linear regression equation which simultaneously (F Test) is significant at a level smaller than $\alpha = 0,05$ is a multiple linear regression equation with a premium type of rice sample. Adjusted R^2 test for this equation is worth 49.8%. This means that the independent variables used in this equation can explain the relationship to the inflation rate of 49.8%. In addition, 50.2% ($100\% - 49.8\% = 50.2\%$) were able to be explained by other variables not included in this study. The Partial Test or T-Test for each of the independent variables of this equation is as follows.

- a. *Constanta (β_0)*. This equation constant is 1.082 and is significant at the level below 0.05. This means that if the other independent variables are ignored, then the inflation rate in Bone Regency for premium rice is 1.082%.
- b. *Rice Stock (X_1)*. The variable coefficient of rice supply is -0.102 and is significant at levels below 0.05. This is following the study by [9] which states that the coefficient of rice supply should be negative rice supply has a negative relationship to the inflation rate. That is, if inflation increases if the rice supply is added, then the inflation rate will slow down. According to [6], the supply of premium type rice in Bone Regency tends to be supported by abundant total yields and can meet the needs of its people.
- c. *Real Exchange Rate/RER (X_3)*. The real rupiah exchange rate coefficient is negative towards the inflation rate of rice in Bone Regency. This is not in line with the Marshall-Lerner theory which states that the RER coefficient should be positive. That is, if the real exchange rate increases, it will affect the increase in the inflation rate in the area. However, this negative relationship can occur because the analysis in this study is limited only to the relationship/influence between inflation and the real exchange rate without regard to other economic variables such as output gap, inflation expectations.
- d. *Dummy Variable*. The dummy variable coefficient is 0.092 and is significant at levels below 0.05. The dummy variable which is worth 1 (describing the situation after the HET Rice policy is set), shows that the positive Dummy Rice dummy policy has a relationship with the increase in the inflation rate in Bone Regency for premium types of rice.

The aim of the government to issue the HET Rice policy in general is to reduce the inflation rate. Rice is one of the commodities contributing to inflation. However, the results of this study show otherwise. The HET Rice policy increases the inflation rate significantly, especially on premium rice. This is consistent with the findings that this HET Rice policy will trigger the occurrence of asymmetrical vertical price transmission. As a result, prices at the farm level are lower and do not match the prices set at the HPP.

The four multiple linear regression equations are three of which are equations that refer to the types of premium rice (Makassar City, Pare-pare City, and Bone District). Only the first equation in the sample City of Pare-pare is medium type rice, there has been a shift in the preference of medium rice to premium rice. Market operation by Bulog would be more effective if it included premium rice into market operations.

The HET rice policy is also considered to be inappropriate in South Sulawesi Province. This is because the price of rice in South Sulawesi Province has never burdened consumers. The possibility of turbulence in the price of rice with the enactment of the policy is during a weather anomaly that causes farmers not to be able to harvest. This will cause price upheaval, but the price of rice is limited by the HET policy, so farmers are feared to bear no small losses [11].

4. Conclusion

The results showed that 4 of the six samples indicated that there was a significant influence by the HET Rice policy on the inflation rate of rice. The policy made the rice inflation rate increase. The system made the rice inflation rate increase. Rice is included in the volatile food category, and the government feels it is necessary to review this policy. The reason is that rice is a mass-produced agricultural commodity. HET is usually used in products outside agricultural products. The assumption of the highest retail price is more suitable for commodities in the category of administered prices such as BBM.

Also, the adjusted R^2 value is considered still not stable for explaining the effect of the independent variables tested in this study on the inflation rate. In the future, research on similar topics is expected to be able to improve this research and more research with related issues to help the government in overcoming the polemic of rice prices.

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