The Pattern Identification of Rice Pricing Determination in the Local Farmer Level

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Keywords: Production Cost; Rice Prices; Rice Production; Rural Farmer.

Abstract: This study to pattern identification of rice pricing determination in the local farmer level of South Sumatera. The data used are primary data as many as 400 respondents of farm households in South Sumatra. The method used in this study is the qualitative descriptive analysis and the quantitative approach using the linear regression model with the estimation of ordinary least square (OLS). The findings of this study indicated that the pattern of rice price setting in the sub-district level of the relative is controlled by large traders, most of whom have cooperated with milling owners in the rural level. The price formed at the sub-district level is the sum of the purchase prices at the rural level plus the profit margins agreed upon by the wholesalers at the sub-district level with the milling owners in the rural level. We found of this study that the defined profit margins ranged from 16-36%. The model estimation result indicated that jointly the independent i.e. rice production, input cost, labor cost, and dummy variable significantly affect the rice price at the rural level. Meanwhile, partially the variables that significantly affect the rice price at the rural level are labor costs and districts dummy variable (D1 and D2), while the rice production and input costs insignificant affect the rice price in the local farm level (rural market).

1 INTRODUCTION

The implementation of food policy so far has only focused on one side, namely on increasing rice production to maintain rice self-sufficiency, while on the other hand, food policy wants cheap rice prices. These two policies are a source of problems that will affect producers and consumers, from the producer side will cause farmers to lack enthusiasm to produce, while from the consumer side, rice is a staple food, which will cause the population to depend on rice (Marwa, 2001).

Meanwhile, in the central regions of rice production will be fulfilled and the price level is low, but in other places the availability of rice is inadequate and the price level will be high. Therefore, the distribution aspect that is closely related to the availability of adequate transportation infrastructure to ensure the mobilization of goods and people must absolutely get the attention of all parties, especially the government.

The consumption aspect, people will be able to access rice, if they have purchasing power. The level of people's purchasing power depends largely on the income level and the rice price that applies in the local market. The higher the level of rice prices prevailing, the lower the community's ability to obtain sufficient and quality rice. Price fluctuations in agricultural products, especially rice must receive special attention from the government, this is indicated by policy interventions to maintain price stability. Despite the special attention, the issue of price fluctuations between time and place continues to occur. Every harvest season, the price of rice at the farmer level drops, even below the base price.

The price of rice in most rice-producing regions in South Sumatra at the farm level often experiences very large fluctuations. In Figure 1, shows the trend of rice prices at the village level, retail prices, and large base prices which continue to increase, but when viewed from these data the basic of rice price (the rice price of farmers level) has a large gap compared to the rice price at rural level and retail prices. Even though the price level has been regulated by the government with the lowest price policy, the price of rice at the farm level often experiences a decline far below the lowest price of the government regulation.

In addition, one of the causes of the asymmetric transmission of prices between vertically connected markets is the presence of uncompetitive behavior

between intermediary traders, especially if the intermediary trader is in a concentrated market (Vavra & Goodwin, 2005). Generally, the intermediary trader will try to maintain the level of profit and will not increase or decrease the price according to the actual price signal. So that intermediary traders will more quickly react to price increases compared to price reductions, this condition causes competition restraint on distribution channels and imperfect price transmission between producer and consumer levels. In the end, the farmers and consumers markets are not integrated.
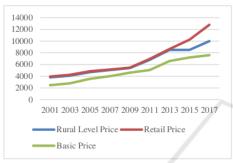

Figure 1: The trend of rice price in the level
(Source: BPS, South Sumatera in figure)

Meanwhile, the occurrence of price transmission between two different market levels in one marketing chain is caused by an uncompetitive market(Meyer & Cramon-Taubadel, 2004and Palaskas & Harriss-white, 1993). Even for agricultural commodities, it is clearly stated that imperfect competition in the marketing chain opens the space for the middleman to abuse their market power. Therefore, there is a possibility that there are two roles in the market; first, the market facilitates trade and allows distribution and allocation of resources in the community; second, the market allows all traded goods and services to evaluate in determine rice price (Azwardi, Bashir, Adam, & Marwa, 2016; Chizari, Sani, & Kalashami, 2013).

Some previous studies have analyzed the factors that influence rice prices with macroeconomic assumptions such as study conducted by Azwardi, Bashir, Adam, & Marwa (2016); Chizari, Sani, & Kalashami (2013). Therefore, this study aims to identify the rice prices determinants in the local farmer level, and the factors that determine the rice price such as rice production, input cost, labor cost, and use dummy variable for the region of rice production center in South Sumatra.. In the second session, we will present a literature review. The third session, we will present the analysis method used. Next, in the fourth session, we present the findings

and discussion, and our last session presents conclusions from the results of this study.

2 LITERATURE REVIEW

Food prices in each market are related to each other, therefore, communication between producers and consumers in each market will be intertwined through price signals. So price is a form of communication signals that serve many variations to coordinate market decisions. The strength of market demand and supply will shapes market prices. If the inter-market has a link between the power of demand and supply, so the inter-market price will integration (Cheung, 2008; Emokaro & Ayantoyinbo, 2014; Marwa, 2001)

Several studies show that the price of rice in the region depends on market prices in other regions, as the study the study conducted by Azwardi et al. (2016) looking at the macro aspect, the impact of government policies through subsidies on rice production in Indonesia, the findings of this study indicate that the subsidy policy determines the level of rice consumption in Indonesia. Government policy through subsidies is strongly influenced by the level of rice prices. This condition shows that the government is trying to maintain price stability through subsidies and also efforts to build food security in terms of demand and supply.

In addition, study conducted by Adam et al. (2017) see more clearly how the marketing distribution pattern of rice in South Sumatra, the findings result of the distribution pattern of rice commodity marketing in South Sumatra shows that the marketing distribution channel of rice is still going through a long stage, therefore is a need for the role of government through BULOG as an absorbent of farmers' production so that shortening the rice distribution chain can also stabilize prices at the farm level.

Nominally, the trading margin of rice traders' is higher than the trading margin of farmers. However, the rice trade margin ratio of farmers is higher than trade margin ratio of traders. The result of this findings indicates that farmers in South Sumatera have the efficient categorized.

Furthermore, a study conducted by Timmer (2004) the results of the study found that in the long run, Indonesia has made improvements to food security, these improvements have been driven by successful economic growth and green revolution, planted with superior types of rice, massive infrastructure investment in the countryside, including irrigation, and the availability of sufficient

fertilizer. In 1998, Indonesia experienced a financial crisis which resulted in the destruction of domestic rice prices which were far higher than the world price of rice. Thus some productivity gains have favored rice farmers. However, this will cause the loss of consumers and also have a large impact on the number of individuals living below the poverty line.

A study conducted by Marwa et al. (2017) the findings result of the study indicated integration between the price of rice at the producer level and the price of rice at the consumer level. In addition, the three sample regions have IMC value less than 1, meaning that both markets have vertical integration in the short run.

Another finding of this study is that the high price difference at the local market level is due to the long distribution of rice commodities in South Sumatera. According to Marwa et al. (2017) efforts in form of government intervention is particularly needed at the local market-level on pricing policy by shortening the distribution channels.

3 RESEARCH METHOD

The scope of this study is rice-producing regions in South Sumatra such as East OKU, OKI, and Banyuasin district. The sample in this study is farmer households as many as 400 respondents. The analytical method used is descriptive statistical analysis, and the quantitative approach uses which is the linear regression model to determine the factors that effect on the rice price in the local farmer's level. The variables used among another rice price (Pr), total production (Qr), input costs (CI), and labor costs (CL), and the category of central areas of production. The results will be confirmed by the conditions that occur in the field in this survey. The multiple linear regression model with OLS estimation method is presented in the equation as follows:

$$Pr = f(Qr, CI, CL) \dots \dots \dots \dots \dots \quad (1)$$

Then, the equation (1) is presented in semi-natural logarithm form in equation (2) as follows:

$$lnPr_i = \alpha_0 + \beta_1 lnQr_i + \beta_2 lnCI_i + \beta_3 lnCL_i + \beta_4 D1_i + \beta_5 D2_i + \varepsilon_i \dots \dots \dots \dots \quad (2)$$

where: Pr is the price of rice (dependent variable), and the independent variable among other as Qr is rice production; CI is the input cost (not including labor); CL is labor costs; D1 is dummy variable with category from East OKU district value = 1 and

another district with value = 0; and D2 is dummy variable with category OKI district value = 1, while another district is value = 0.

4 RESULT AND DISCUSSION

The type of agriculture in South Sumatra, especially the small part of rice food crops, is technical irrigation, especially in the East OKU area, while in other areas it still applies rainfed systems such as district OKI and Banyuasin. The district OKI has now received attention by the regional government with making irrigation, but still in certain areas as an experiment. Based on information from the local farmers that the district government of Banyuasin will be making programmed to build irrigation for wetland paddy.

Table 1: Description of agriculture system

| District | Agriculture system | | Total | Percentage |
	Irrigation	Rainfed		
East OKU	131	15	146	36.50
OKI	77	117	194	48.50
Banyuasin	0	60	60	15.00
Total	**208**	**192**	**400**	**100.00**

Source: Authors calculation, 2017

Based on Table 1, the agricultural system in the area that we observed, that East OKU district became an area where most of the wetland paddy was the flow of water sourced from rivers that entered the irrigation that had been made so that during the rainy season the water supply would be more.

Meanwhile, the OKI and Banyuasin districts still apply the rainfed system as the water source which flows to wetland paddy, meaning that the harvest season for this region depends on the stored rainwater supply. On the other side, the land area owned by farm households in East OKU, OKI, and Banyuasin regencies is quite diverse. Based on the survey results, we found that most farm households had an average of less than one hectare of wetland paddy.

This makes the farmers only benefit the harvest for their daily needs. Meanwhile, we also get information that most farm households still land rent with the profit-sharing system with landowners.

Table 2: Production, land area, and productivity

District	Total Production (tons)	Land area (ha)	Land productivity ton/ha
East OKU	1.602	351	4,56
OKI	1.317	203	6,48
Banyuasin	640	122	5,27
Average	**1.186**	**225**	**5,43**

Source: Authors calculation, 2017

Meanwhile, based on the survey, we found that most of the paddy harvested by farmers still ranged from 0.6-19 tons per year, this indicated that most farmers in South Sumatera still have the wetland paddy small. From the survey results, we also get information about 90.89% of farmers to produce less than 20 tons per year with a range of land of only 0.5-6 hectares, and with average harvest only two times per year.

In terms of wetland productivity, the average wetland productivity is 5.43 tons per hectare, the results show that paddy production is still ideal. The largest producer of wetland paddy is OKI District with the value of 6.4 tons per hectare. Meanwhile, Banyuasin district only reached 5.27 tons per hectare, and the lowest was East OKU District which only reached 4.56 tons per hectare. Based on the information, yields in East OKU district experienced a decline in yields, even this year the crop yields failed due chemicals contained in excess soil and more found of rat pest

Based on the survey results, we found that not all paddy yields from farm households are all sold, some are stored for consumption and some are used as seeds for production in the next year. The proportion of paddy harvested which sold from these three districts averages around 80% of the total production.

We also found that each region had a different proportion of the amount of rice sold. East OKU district has the largest proportion of paddy harvested which sold reaching 88% of total production. While the OKI and Banyuasin district, the proportion of paddy harvest that was sold only reached 77% and 73% of the total production.

Table 3 indicated that the production costs per hectare in a year are quite diverse, but the highest production costs are in the OKI district reaching 8.2 million per year per hectare. Meanwhile, East OKU district only reached 4.2 million, while the lowest production cost in Banyuasin district only reached 3.5 million per year per hectare. Thus, farmers still have an advantage because the difference between total revenue and total production costs shows a positive

value, this has provided evidence that most farmers in these three regions are still benefiting from their sales.

Table 3: Components of production costs per ha

District	Total of production cost/year (Rp 000)		
	Production cost	Landarea (ha)	Cost per (ha)
East OKU	1,486,029	351	4,231
OKI	1,679,927	203	8,265
Banyuasin	425,055	122	3,498
Average	**1,197,003**	**225**	**5,331**

Source: Authors calculation, 2017

Generally, we found that the average production cost reached 41.3% of the total sales revenue of farmers. While the average profit reaches 58.7% of farmers' income because there is a portion of the harvest that is still stored for consumption needs.

Table 4: Components of cost and Profit

District	Components of cost (Rp. million)			Profit per ha
	TR	TC	Profit	
East OKU	5,293	1,486	3,807	10,706
OKI	3,856	1,680	2,176	10,838
Banyuasin	1,869	425	1,444	11,883
Average	**3,673**	**1,197**	**2,476**	**11,142**

Source: Authors calculation, 2017

When viewed based on the benefits of farmers per hectare per year presented in Table 4 shows that the average profit of farmers per hectare per year reaches 11.1 million. The calculation results, the Banyuasin district has the biggest profit reaching 11.8 million per hectare per year.

Furthermore, OKUT district reached 10.8 million per hectare per year, while OKI district amounted to 10.7 million per hectare per year. This result indicated that farmers are still classified as efficient, but these costs do not include other costs of this survey. The pattern of determining rice prices at the farmer level and sub-district level can be seen in the conditions of paddy and rice price levels at the farmer level (rural market) and at the sub-district level shown in Table 5 which are presented as follow

Table 5 indicates that the price of rice at the rural level is relatively lower than the price of rice at the sub-district level. The average price of rice at the rural level is Rp.7,295 per kg, while the price of rice at the sub-district level is Rp.9,242 per kg, we found that the

price level at the sub-district level was on average 27% higher than the price at the rural level.

Table 5: Price of dry paddy and rice at the rural and sub-district Levels

District	Price of rural level (Rp/Kg)		Price of sub-district level (Rp/Kg)
	Dry paddy	Rice price	Rice price
East OKU	3,737	6,924	9,450
OKI	4,082	7,563	8,775
Banyuasin	3,993	7,399	9,500
Average	3,937	7,295	9,242

Source: Authors calculation, 2017

This condition indicates that traders take relatively large profits in the process of distributing rice from the producer level to the consumer level of more than 20%. We also found that most farmers sell paddy to the mill owners, so at the rural level farmers sell in the form of paddy, not in the form of rice. Farmers leave only a small portion of their crops for seeds and supplies for consumption.

The pattern of pricing at the rural level is relatively biased to buyers (milling owners), buyers have greater power in determining prices than farmers. Price agreements between buyers and sellers at the rural level are dominated by buyers (milling owners). The more dominant milling owners in determining price levels are caused by (1) the high dependence of farmers on milling plants to process paddy into rice; (2) most farmers already have debts to the mill owners; and (3) there is behaviour monopsony nor oligopsony, which agreed among buyers in the rural level.

The pattern of price setting of rice at the sub-district level is relatively controlled by large traders, most of whom have cooperated with milling owners at the village level. The rice price formed at the sub-district level is the sum of the purchase prices at the rural level plus the profit margins agreed upon by the wholesalers at the sub-district level and the milling owners at the rural level. Based on the results of the study it was found that the profit margins that were set ranged from 16-36%.

The estimation results of the model to examine the effect of rice production, input costs, labor costs, and district dummy on rice prices at the local farmer level are presented in Table 6. From Table 6 it can be seen that jointly the variables of rice production, input costs, labor costs, and the district dummy significantly affects the price of rice in rural areas.

Table 6, indicated that partially, which significantly affects the rice price (lnPr) at the rural level is the labor cost (lnCL) and dummy variable of the district (D1 and D2). Meanwhile, the rice production and input costs insignificant affect the rice price at rural level.

Table 6: The model estimation result

Variable	Coefficients	Tolerance	VIF
Constant)	8.039*** (0.086)	-	-
lnQr	0.007 (0.004)	0.306	3.263
lnCI	-0.007 (0.006)	0.301	3.325
lnCL	0.019*** (0.005)	0.523	1.911
D1	-0.076*** (0.007)	0.347	2.883
D2	0.020*** (0.006)	0.389	2.573
Obs	400		
R^2	0.541		
R-adjusted	0.535		
F-test	94.244		
DW-test	1.821		

Source: Authors calculation, 2017

The variable of labor costs significantly affect the rice price in the rural level and has the positive sign, meaning that the higher the costs incurred to pay labor, then the higher the rice price. This condition is understandable because most of the activities in the process of producing paddy or rice are depend on labor, from preparing the planting to harvesting and post-harvest. This component of labor costs includes cleaning costs, planting costs, maintenance costs, and harvest costs. Meanwhile, district dummy variables can indicate whether there is a difference in the average price level of rice in each district that is sampled. Based on the results of the study, we found that there were differences in average rice prices between OKU Timur, OKI and Banyuasin district, which one average on the rice price in East OKU district is lower than average on the rice price in Banyuasin district and OKI.

The variable of rice production (lnQr) and input costs (lnCI) insignificant affect the rice price at the farmer level (rural market). The insignificance of the variable of rice production affect the rice price in the rural level is caused by the price level that is formed at the rural level is not determined by the market mechanism but tends to be determined by the buyer,

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in this case the milling owner, where the price set tends to be below the government decree price. Although the prices in the rural market are below the government decree, farmers are forced to sell their crops to the milling owners in the rural level, this condition gives a strong indication that the structure of the rice market in rural level tends to be monopsony and or oligopsony which agreed. Meanwhile, the insignificance of the input cost variable (InCI) in influencing the rice price in the rural level is caused by the relatively fixed and unvaried input costs in the rice farming process. As the result of the relatively fixed and varying input costs, the rice price elasticity on input costs is very in-elastic, this is indicated by the coefficient of rice price elasticity to the input cost is -0.007 (Table 6).

5 CONCLUSIONS

The pattern of price fixing at the rural level is relatively biased to buyers (milling owners), buyers have greater power in determining prices than farmers. Price agreements between buyers and sellers at the rural level are dominated by buyers (milling owners). The more dominant milling owners in determining the price level are due to: (1) the high dependence of farmers on milling plants to process paddy into rice, (2) most farmers already have debts to the mill owners, (3) there is behaviour monopsony and or oligopsony behaviour which agreed among buyers at the rural level.

Meanwhile, the pattern of rice price setting in the sub-district level of the relative is controlled by large traders, most of whom have cooperated with milling owners in the rural level. The price formed at the sub-district level is the sum of the purchase prices at the rural level plus the profit margins agreed upon by the wholesalers at the sub-district level with the milling owners in the rural level. We found of this study that the defined profit margins ranged from 16-36%.

The conclusion from the model estimation result indicated that jointly the independent i.e. rice production, input cost, labor cost, and dummy variable significantly affect the rice price at the rural level. Meanwhile, partially the variables that significantly affect the rice price at the rural level are labor costs and districts dummy variable (D1 and D2), while the rice production and input costs insignificant affect the rice price in the local farm level (rural market).

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