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MARKET INTEGRATION AND RESPONSE OF RICE MARKET AGENTS IN SOUTH SUMATERA

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ABSTRAK

Tulisan ini bertujuan untuk menganalisis bagaimana integrasi pasar (keterkaitan antara pasar pusat dengan pasar-pasar lokal, dan respon pelaku pasar (produsen, konsumen dan pemerintah) terhadap perubahan variabel harga (harga beras eceran, harga beras tingkat petani, harga jagung, harga pupuk, pendapatan) dan variabel bukan harga (jumlah penduduk, impor beras, *'lag'* penawaran *'lag'* permintaan 'lag' stok yang dikuasai)". Data yang digunakan adalah data sekunder yang diperoleh dari publikasi instansi yang berwenang. Model analisis yang digunakan adalah model persamaan simultan dan diestimasi dengan menggunakan Two Stage Least Square (2SLS)

Berdasarkan hasil analisis data diperoleh bahwa pasar beras di Sumatera Selatan terintegrasi. Respon harga pasar lokal terhadap pasar pusat relatif bersifat sempurna. Terintegrasinya pasar beras di Sumsel di antaranya disebabkan oleh relatif tingginya mobilitas komoditi beras antar pasar, baik antar pasar lokal dengan pasar pusat, maupun antara pasar lokal yang satu dengan pasar lokal yang lainnya. Permintaan beras, stok beras, harga beras di pasar pedesaan, harga jagung, dan harga pupuk tidak signifikan mempengaruhi penawaran beras. Respon permintaan beras terhadap variabel harga beras eceran bersifat inelastis. Respon permintaan beras terhadap jumlah penduduk bersifat elastis, sedangkan penawaran beras, harga jagung, dan tingkat pendapatan tidak signifikan mempengaruhi permintaan beras. Variabel penawaran beras, permintaan beras, harga beras di pasar pedesaan, harga beras eceran, impor beras, dan jumlah penduduk tidak signifikan mempengaruhi stok beras.

Kata kunci: integrasi pasar, respon produsen,respon konsumen,respon pemerintah

ABSTRACT

This article is aimed to analyze the market integration to find out the connection between centre market and local market, and response of rice market agents (consumer, producer and government) towards the change of variable price (price of rice, corn, fertilizer, and income), and non price variables (population, rice import, supply lag, demand lag, stock lag). Data used were the secondary data which obtained from official publication. Analysis model used is simultaneous regression model and estimated by using Two Stage Least Square (2SLS).

Based on the result of data analysis, the rice markets in South Sumatera are integrated. The response of local market price is relatively perfect. The integrated rice market in South Sumatera is caused by relatively high mobility of rice local and central markets. Rice demand, stock, rice price in the village (producer) market, corn price, and fertilizer price are not significantly influencing the rice supply. Response of rice demand to retail rice price is inelastic. Meanwhile response of rice demand to population is elastic, but rice supply, corn price, and income are not significant influencing the rice demand. Rice supply, rice demand, rice price in the village markets, retail rice price, rice import and population do not significantly affect the rice stock.

Keywords: market integration, producer response, consumer response and government response

INTRODUCTION

Background

Rice is very special commodity, because rice is the basic food in the most regions in Indonesia, including South Sumatera. Lacking in rice stock will easily influence politic, social, economic, and security problems. Rice is basic food of people which stock, distribution, and price level are very significantly influencing stability. On one side, population is increasing significantly, and rice consumption rate is still high (more or less 133 kg/capita/year), directly influence increasing of rice demand. On the other side, improvement of rice production has handicap, because of decreasing in farm land changed into industrial land, real estate, and other economical facilities. Although the technology is improving, but the impact rate is still leveling off from productivity improvement of rice farmer productivity.

Generally the purposes of farming policy in most countries, especially third country is for producer, consumer welfare and safety stock for long period. Producer welfare means improvement of farmer income normally, so in long period the farmer welfare is increasing and not left behind from other farmer groups.

Consumer welfare means ready stock of general crop and especially food on suitable price for the farmer as producer and people as consumers. Safety stock means not only reaching enough stock for food but also the available safety stock. Safety stocks shown by fulfill the demand on fluctuation price.

On one side farming policy used to concentrate to improve rice production in order to reach safety stock, on other side it concentrates to lead "Cheap price of rice". These two Policies are unfortunately cause food problem. The impacts of these policies are: (1) On producer side, farmers have no motivation to produce, (2) on consumer Side, People are really depending on rice.

Food problems (especially rice) which may rise depend on the response of farmer and consumer and government in order to solve the change of condition that is influenced them. The conditions are price variable and non price variable. Generally price variables are the price of food (rice) itself, price of rice substitution, input price etc. Non price variables are population, income, rice import, etc.

The case of farming product price, especially rice has special attention given by Government; it is shown by intervention policy to keep it stable. Although got special attention, annual problem always appears that every annual crop comes, the price of rice at farmer level is decreasing until under low price level. While on planting season or hard time, the price of retail rice on consumer level is increasing highly. Besides differences between seasons, differences of price among locations can happen; like differences of price between production centre and retail market, and among local market and centre market.

Distribution of rice commodity from centre production market to retail market or from local to centre market used to get some handicaps, for examples; distance problem and other infrastructure problems. As the result caused by the problems will raise the difference of price among the market. Markets have integration price among the others. It happens because seller and buyer will communicate each other through price signal. So price is signal communications which serve much variation to coordinate market decision. Strength of market demand and supply perform market price. If among the markets have strength integration of demand and supply, the price among markets will have integration.

Aims of the Study

Based on explanation above, so this paper will examine how market integration (integration between centre market local markets), and response of market agents (producer, consumer, and government) to changes of price variables (rice price, corn price, fertilizer price, income) and non price variables (populations, rice import, supply lag, demand lag, available stock lag).

METHODOLOGY

Data

Data used were the secondary data which obtained from official publication. Used time series data are from 1989 to 2007. Analysis model used is simultaneous regression model and estimated by using Two Stage Least Square (2SLS).

Market Integration

To determine Market Integration level, we use Simple linear regression by following criteria of Monke and Petzel below;

$$Px = a + b\,Py \quad \ldots\ldots (1)$$

Where;
Px = Price of rice in local market
Py = Price of rice in center market
a and b = Parameters

Using criteria of Monke and Petzel,1984, in Taufiq, 2001:103); If two markets are independent, so the movement price at two markets will spread randomly, or independently each other. It means the markets are not integrated. It is shown by coefficient b that statistically is not different from 0 (zero), meaning there is integration between the analyzed two prices. It also means until certain level, there is market integration. In detail the integration is shown on Table 1.

Table 1. Level of market integration based on simple regression analysis

No	coefficient	Price Integration	Integration Level
1	a = 0, b = 0	Independent	Not Integrated
2	a ≠ 0, b = 0	Independent	Not Integrated
3	a = 0, b>0 & b = 1	Identical	Integrated
4	a = 0, b>0 & b ≠ 1	Pure percentage premium	Integrated
5	a ≠ 0, b>0 & b = 1	Absolute premium	May be Integrated
6	a ≠ 0, b>0 & b ≠ 1	Pure. Perc & abs. premium	May be Integrated

Source: Taufiq, 2001:103

In this paper, centre markets are rice markets in Palembang city (capital of province), while local markets are regional markets in OKU, OKI, MUBA, MURA, Muara Enim, and Lahat.

Response of Market Agents

Response of Market Agents in this study consist of: (1) Response of rice supply (rice production) to rice demand, rice stock owned by government, price of rice in village markets lag, input price (fertilizer price) lag , substitution commodity price (corn price) lag, and total production previous year. (2) Response of rice demand (population consumption to rice supply, retail rice price, corn price, population amount, and previous year stock). Model simulation equation system using Two Stage Least Squares (2SLS) method is used to estimate three structure equations as follows:

a. Supply Function

Rice Supply Function (QS), it is assumed rice demand function (QD), rice stock (S), rice price in village market lag (HD_{t-1}), Input price lag (fertilizer price) (HP_{t-1}), commodity substitution price lag (corn price) (HJ_{t-1})

and total production previous year (QS_{t-1}).

$$QS = a_0 + a_1QD + a_2S + a_3HD_{t-1} + a_4HP_{t-1} + a_5HJ_{t-1} + a_6QS_{t-1} \quad \ldots\ldots\ldots\ldots\ldots (2)$$

b. Demand Function

Rice demand function (QD), it is assumed rice supply function (QS), retail rice price (HE), commodity substitution price (corn price) (HJ), population amount (JP), Income (I), and previous year demand (QD_{t-1}).

$$QD = b_0 + b_1QS + b_2HE + b_3HJ + b_4JP + b_5I + b_6QD_{t-1} \quad \ldots\ldots\ldots\ldots\ldots (3)$$

c. Stock Function

The amount of rice stock handled by government (S), it is assumed rice supply function (QS), rice demand (QD), rice price in the village (HD), retail rice price (HE), rice import (M), population amount (JP), and previous year stock (S_{t-1}).

$$S = c_0 + c_1QS + c_2QD + c_3HD + c_4HE + c_5M + c_6JP + c_7S_{t-1} \quad \ldots\ldots\ldots\ldots\ldots (4)$$

RESULT AND DISCUSSION

Market Integration

The result of data analysis about integration between centre market and local markets is shown on Table 2.

Table 2. Estimated result of centre market effect to local market

Variable	Constanta	HPLG	F	R^2	Elasticity
HOKU	-0,022 (-0,094)	1,003 (31,605)	998,873	0,983	1,003
HOKI	0,088 (0,285)	0,989 (23,355)	545,462	0,970	0,989
HMUBA	0,091 (0,462)	0,994 (36,914)	1362,641	0,988	0,994
HMURA	0,035 (0,207)	0,995 (43,404)	1883,934	0,991	0,995
HME	0,479 (1,910)	0,939 (27,413)	751,490	0,978	0,939
HLHT	0,562 (2,132)	0,926 (25,728)	661,912	0,975	0,926

Source: Result of data analysis
Note: number in ( ) is amount t statistic

Table 2 shows significantly that coefficient Price of centre market variable (HPLG) by statistic. Based on criteria Monke and Petzel shown above, local markets and center market are integrated. Regression Coefficient Price of centre market variable can also tell information that Price of centre market variable significantly effects to price of local market, marked by coefficient elasticity that are all nearly 1.

Strong relation between central market and local market in South Sumatera Province is affected by relatively easy movement of rice product between the markets because transportation is relatively good.

Rice Supply Function

Independent simulation variables (rice demand, rice stock, rice price in village / rice price at farmer's level, corn price, fertilizer price, and lag 1 year supply) real affects rice supply in South Sumatera. Rice quantity supplied in year t assumed affected by independent variables one year lag. It shows that farmer's production in this year which is really affected by conditions when the farmers plant the rice (previous year condition = t-1). Estimated result is shown by function as follows:

$$QS = 7,487 - 0,00313QD + 0,012584S - 0,306651HD_{t-1} - 0,010325HP_{t-1} + 0,549909HJ_{t-1} + 0,351002QS_{t-1}$$

Standard Error: (7,32) (0,398) (0,048) (0,3859) (0,1361) (0,447) (0,3485)

Rice demand variables and rice stock are partially not significant affecting rice supply. It means farmers' behavior in working without any attention about demand of their product and stock policy stated by government. Rice price variables in village markets 1 year lag, statistically are not significant at 90% level. It is affected by rice price to quantity supplied by producer that has less response about changes of rice price variables. The less response of producers shown by elasticity coefficient is inelastic, it is -0.31. Rice supply is inelastic because of the farmers have handicap to expand their business. Their handicaps are very limited area and limited input product. Substitution price variables (corn price) are not significant affecting rice supply. One of affect is the area to plant rice and corn separately. So it is inelastic. This condition is less elastic of rice supply response to change of corn price variable identifying rice and corn are complement each other. Fertilizer price variable is not significant at 90% affecting various rice Supply, it is caused by limited fertilizer used for land farming with technical irrigation, which relative small area compared with rainy farm area. On rainy farm area, generally using fertilizer is very limited. Besides price level used to apply at subsidy price level, so the change is not various. Lag 1 year supply variable has affected positively to rice supply, but statistically is not significant at 90%. It identifies that long term elasticity is not different with short term supply elasticity. So the farmers are really difficult to change the way how to plant.

Rice Demand Function

Independent variables (retail rice price, corn price, income, population amount, and lag 1 year demand) together affect significantly various dependent variable Value (quantity demand). Estimated result of demand function shows in equation as follows:

$$QD = -4,8998 + 0,0247QS - 0,070HE + 0,037HJ + 1,0437JP + 0,0332I + 0,116QDt-1$$

Standard Error: (0,947) (0,054) (0,032) (0,042) (0,064) (0,023) (0,064)

Retail rice price variable is partially significant affecting rice demand. Demand elasticity of rice price in South Sumatera -0.07. With -0.07 (less than 1), meaning elasticity is inelastic. Indeed rice is basic need, so the impact of price change is not significant to rice demand. Corn price variable is not significant affecting rice demand in South Sumatera. Corn price and quantity demand are positive, this condition means that corn is really substitution food instead of rice. But cross elastic-

ity coefficient is really inelastic which means substitution level between rice and corn very distant or very low. Income is not significant at 90% level. It is caused by the rice is basic need. Demand elasticity coefficient is 0.03 means inelastic. This condition is hard to add or to decrease rice quantity in short term. Population is significant to influence rice Demand, the coefficient is positive that is elastic. This condition is caused by increasing population affecting rice demand, because it is basic need. Lag 1 year demand has positive relation and significant at 90%. This condition means that last year demand affected up to date demand. While 1 minus demand coefficient is 0.116, so it will be adjusted coefficient. It means there is no handicap to increase demand. Based on this result, short term demand is relative same to long term demand, so rice is basic need commodity which is inelastic. The change of rice price has response by population in South Sumatra in the same percentage both in short term and long term.

Rice Stock Function

As simultaneous that variable is not significant to stock handled by government.

ST = -59,921-0,151QS -9,884QD + 6,376HD-6,58HE-0,072M + 13,953JP - 0,593St-1

Standar Error:	(125,806)	(2,724)	(20,996)	(5,544)	(5,499)	(0,233)	(24,243)	(0,411)

Rice price variable in village market and retail rice price are partially not significant. It means that rice stock is not responsive to rice price change. One of factor caused not significant, because response of government is relatively slow. Other factors, because government program only oriented to season, and interval of ceiling price and floor price. Rice import (M) is not significant to rice stock. It causes rice import only to fulfill the lack of demand not to add rice stock. The population is not significant to rice stock, because stock government policy does not consider population amount. Lag Rice stock is not significant to rice stock, because last year rice stock is not affecting various this year rice stock. This condition can be seen by coefficient elasticity which is inelastic.

CONCLUTION

1. The rice market in South Sumatera is integrated, because of high mobility of rice between local and center markets.
2. Rice demand, rice stock, rice price in rural (producer) market, corn price, and fertilizer price are not significantly affecting the rice supply.
3. Response of rice demand to retail rice price variable is inelastic. Response of rice demand to population is elastic, but rice supply, corn price, and income are not significant influencing rice demand.
4. Rice supply, rice demand, rice price in rural market, retail rice price, rice import, and population are not significant to rice stock.

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