Analysis of Rice Market Integration in Southeast Sulawesi

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Abstract: The analysis of rice market integration in Southeast Sulawesi aims to determine the level of market integration between farmers and consumers. Data used in the research is secondary data in the form of time series. The data gathered were through publications, official statistics, and other relevant institutions. The analysis method used in the study is model of Ravallion on market integration model of Monke and Petzel model regression. The results of this research showed that the market did not occur between the rice market in central consumers and farmers market.

Keywords: Rice Market Integration, Local Market

1. Introduction

Rice market is the demand and supply situation of rice in the country and abroad. But the demands and supply of rice if there is no government oversight or intervention for the import and export of rice market structures reflect inefficient price formation. Pricing is the mechanism of supply and demand, which can measure the price elasticity. In other words; the price elasticity is used for the production and pricing policy in order to see the changes in the price offered at the market price.

In addition, the relationship between supply and demand determines the mutual integration of the rice market related prices in the primary market and the local market price. Prices in major markets and prices in the local market can be determined by the structure of the market, this is because the focus is on the situation of rice production market participants. Structure of critical market in observing the behavior and performance variation due to producers can strategically affect competition conditions, the amount of production and the price level.

On the other hand, the price of rice in Indonesia, many market forces determined by the local and in season. In addition to rice price policy set by the government affecting the stock size is controlled. According Mubyarto (1991), argued that the policy with regard to maintaining price stability benchmark price closer to the actual price. However, the size of price stability in the market is the price variations between the reference price and the actual time or season. This affects the price formation process in turn market integration.

Market integration is a state of the relationship between the wholesale markets with the local market price, where the price changes at the wholesale market level affect the price in the local market. Ravallion (1986) shows that the integration of the market in the short term is a condition in which changes in wholesale market prices will affect the price of the local market. Monke and Petzell (1984) suggested that, if the movement of market integration between the wholesale market and the local market is not free or interdependence. In this connection, the price of rice at the farm level is influenced by the strength of the local market or retailer organization and production conditions.

Movement of agricultural commodities (rice) from production centers or local markets or to wholesale markets usually faces several constraints such as distance or location of the problem and other infrastructure constraints. Consequently there is a difference in the market price of each. On one side of the market price of rice intertwined with each other as determined by the supply and demand situation. The power of the market forces of supply and demand establishes prices at the local level and at the level of consumer prices (mains). State of decline in rice prices, economic agents tend to hold back any more rice than the needs of the market in the hope that prices will stabilize. This in turn will affect both the price of rice in the local market as well as in the wholesale market.

The determination of the price of rice during the last ten years (1999-2008) in the area of Southeast Sulawesi (Kendari, Konawe, South Konawe, Bombana and Kolaka) showed an average increase of 53.79% per year, while rice production increased by an average of 36.58% per year. This situation in turn affects farmers’ terms of trade and the welfare of farmers as producers of rice. Although the trend of rice prices at the consumer level (central market), or increased, but in fact the price of rice or grain at the local level (rice production), has not enjoyed by farmers or in other words that the change in consumer prices do not increase profits rice farmer entrepreneurs.

Implementation of pricing policies both at production and at the consumer level can stabilize prices in the local market and the market wholesale market. The success of the policy depends on the extent of the increase in prices in the wholesale market price levels affect the price in the local market or at the farm level in rice. Thus, the fundamental problem with this study whether the local market is integrated with the central market. Furthermore, the objectives to be achieved in this study to describe and analyze the rice market integration at the local level with the rice market at the consumer level. Finally, the contribution of this research is expected to contribute to the development of economic
science, especially with regard to the theory of markets and price theory. Otherwise it would be useful to the government in preparing the policy of rice price within the framework of an economic development strategy and welfare of rice production for farmers.

2. Review Literature

Market is where buyers and sellers meet to trade resources, goods and services. On the one hand, the market is an environment or space where demand and supply in determining prices, so that ownership of the goods and services transactions (Rinse, 1992). Furthermore, Nicholson (2002) suggests that the market is the interaction between supply and demand in a given period that resulted in the price and quantity of goods. Winardi (1989), the market share the market abstract and concrete markets. Concrete market is where supply and demand comes together in the transaction of goods and services directly, such as capital markets, labor markets, and market goods. While abstract in the market for three interpretations: (1) Overall demands and offers related to one (2) all other areas in which the buyer and seller relationships and transactions. (3) A meeting of all consumers and producers who have an agreement.

The transaction is agreed upon is the amount of goods and the price level. Therefore, there are three types of markets: (1) market by geography, (2) market based on products, and (3) based on the market period. Geographic market is based on so-called market based on the market may include, local regional markets, national markets and international market. While market-based product which is a form of market-traded products such as rice, fish market, etc... Then the market based on the length of time that the market is based on the availability of the product, for example, market fruits during the harvest season. Agricultural product markets which frequently analyzed are geographic based market form; it is distinguished by market production center with the retail market or the local market with the wholesale market. At the level of a particular commodity market consumers have to consider other related commodities. Studying the rice market would be meaningless without learning substitution commodities such as corn or bread.

Market mechanism is the interaction between supply and demand in determining price. Demand is influenced by aspects of elasticity, income, how to buy, cycle, and role of government, substitution and expectations. While influenced by the elasticity of the supply side, marketing, cost, technology, natural cycles, substitution, the role of government and the expectations. It can be effect to the basic conditions can effect to the market structure. Furthermore, the prevailing market structure can affect the number of buyers and number of sellers. In turn, the number of buyers and number of seller concentrate to the market and affect to the market behavior. At last, the market behavior acts as a determinant of the price receiver. (Tomek and Kenneth, 1981)

The market is a mechanism in the form of supply and demand market. Nicholson, (2002), indicates that the market is influenced by the demand side and the supply side. The demand side shows various quantities of products demanded in the market for a certain period of time at various price levels. While the supply side shows various quantities of products sold in the market over a given period on the likelihood of price levels. The mechanism of supply and demand can affect the underlying market conditions. On the one hand, the basic market conditions can affect market structure. While the prevailing market structure may be the number of buyers and the number of sellers, which in turn will concentrate on the behavior of the market and act as a determinant of prices and receiver.

The linkage between the demand and supply of agricultural products such as rice, are affected by the production and prices at the farm level. The Price changes at the farm level are largely determined by the number of production, retail prices in the wholesale markets, season and government policies. Prices in the wholesale market is influenced by the production or supply in the local retail market prices in the local market, the price of rice on the international market and the cyclical nature or the seasons. On the other side of the rice market mechanism, the government's role as a stabilizer of the price of rice, both at farm level and at the consumer level through the base price of the policy (floor price) and the ceiling price (ceiling price).

Movement of agricultural commodities from market centers of production to the retail market or the local market to the wholesale market typically faces several constraints, among other issues the distance / location and other infrastructure constraints. Consequently there is a difference in the price of each market. Market prices are interconnected with each other as determined by the supply and demand situation. The producers and consumers will communicate with each other through price signals. So the price is a form of communication signals that coordinate market decisions. With him that the power of market forces of supply and demand establish prices at the level of the buyer or consumer and producer prices.

Determination of the base price of rice (base price) and the ceiling price of rice (ceiling price) can affect the level of nutrients in the rice farmers (production) and rice prices at the consumer level. In turn it will affect to the rice production. In the short term the price of rice in the local market will affect the market price of rice stem (consumers), but the formation of the local market price or the retailer is highly dependent on wholesale market conditions.

On the other hand in the long-term changes in the market price of the parent and the local market showed a positive relationship but not integrated (Ravallion, 1986). Market integration is a reciprocal relationship between prices in the primary market and the local market price, season or time factor also affects the price formation process (Timmer, 1986). Besides Timmer noted that to measure the of integration level between the markets at the farm level and at the consumer market level using the following formula:

\[ P_{fm} = \beta_0 + \alpha_1 P_{fm} H_{fm} \]  

Where:

\[ P_{fm} = \text{Price at the farmers market at harvest} \]

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In this connection, the structure of the price of rice at the farm level is largely determined by market forces. This in turn will affect to price at the farm gate and consumer prices. Furthermore Mears (1981), shows that the market forces of rice at the farm level is determined by the marketing chain and the organization of farmers or traders at the village level. The longer channel marketing or marketing of rice, the less the price received by farmers. Meanwhile, the price of rice in Indonesia is largely determined by the strength of the local market factors and seasons. Timmer (1986) called it, market forces or the integration of the local market and the consumer market is reflected in the value of the correlation is relatively high prices. The amount of variation in the price of rice between the actual price and the reference price is a measure of the stability of producer prices and consumer prices.

Ravallion (1986), build a model to measure the degree of market integration between market producers at the farm level and at the level of the consumer market with a dynamic approach that is:

\[ P_{it} = \sum_{j=0}^{n} b_{ij} P_{it-j} + \sum_{k=1}^{m} c_{ik} X_{ikt} + e_t \]  

Where:

- \( P_{it} \) = the price of the farmer's market at time \( t \)
- \( P_{it} \) = market price center / customer at time \( t \)
- \( a, b, c \) = coefficient of regression
- \( X \) Factor \( _{ikt} \) = season or when different variables (lag time)
- \( e \) = Error Term

Market segmentation and product prices are now at the center lag market prices should not affect the price of any local market when \( b_j = 0 \) (\( j = 0, \ldots, n \)) Market integration in the short run if the price changes and the market will soon be reflected in local market price, if the integration \( b_j = 1 \) market in the long term if the price is fixed or stable over time, which is not disturbed by the influence of local stochastic.

A general model Ravallion explained that the local market price as a function of changes in the market price of the center, lagged price and other variables that describe the main characteristics of the local market. Moreover, this model can explain the changes in the price intertemporel Ravallion (short-term) as a condition of supply and demand is not stable because of its dependence on the season. In general it can be formulated as follows:

\[ SP = f (INT, USO) \]  

Where:

- \( SP \) = change in price
- \( INT \) = intervention or government pricing policy
- \( USO \) = unexpected change offer.

Proportional models can be predicted with the following models:

\[ P_{it} = f (O_{pt}, P, P_{at}, P_{it-l}, M) \]  

Where:

- \( P_{it} \) = the actual price \( t \) at year \( t \)
- \( O \) operations \( pt \) = the market in year \( t \)
- \( P_{it} \) = stock of rice in year \( t \)
- \( P_{at} \) = price set in \( t \)
- \( P_{it-l} \) = actual price year \( t-1 \)

Monke and Petzel (1984) the actual price and the price set can be predicted with a degree of closeness between the prices in the consumer market at a price other markets. On the one hand, the level of market integration can be expected with the following models:

\[ Px = a + b Py \]  

Where:

- \( Px \) = the price of rice in the local market or at the farm level
- \( Py \) = price of rice in the consumer market or the central market
- \( a \) and \( b \) = parameters.

When two markets are independent of each other, the movement of prices in the market will be scattered at random (random), or related to one another, so the market is not integrated. It will be marked with a coefficient \( b \) that is not statistically significantly different from zero conversely, if the value of the coefficient \( b \) is statistically significantly different from zero, this indicates a dependency between the two prices in the local market and the consumer market or wholesale market.

#### 3. Research Method

In order to gather information about the factors and presenting symptoms and seek the true description of an area of the rice market integration then the research using survey method (Nazir, 1988). This research was conducted in the area of Southeast Sulawesi mainland portion consisting of Kendari, Konawe, Bombana, South Konawe and Kolaka. Of the five regions of Kendari as the center of the rice market, while Konawe, Bombana, South Konawe and Kolaka as the local market. It is on the basis that all four regions (Konawe, Bombana, South Konawe and Kolaka) as a center of rice production in the Southeast. Methods of data analysis related to the integration of the rice market used Ravallion dynamic models and linear regression models Monke and Petzel formulated as follows:

\[ P_{it} = \sum_{j=0}^{n} b_{ij} P_{it-j} + \sum_{k=1}^{m} c_{ik} X_{ikt} + e_t \]  

Where:

- \( P_{it} \) = the price of rice in the local market (Konawe, South Konawe, Bombana, Kolaka & at time \( t \))
- \( P \) = price of rice in the market center (Kendari) at time \( t \)
- \( a, b, c \) = coefficient of regression
- \( X \) Factor \( _{ikt} \) = season or when different variables (lag time)
- \( e \) = Error Term

Egregiasi analysis of the current market price of the product and the market price lag in the middle should not affect the price of any local market when \( b_j = 0 \) (\( j = 0, \ldots, n \)). Market integration in the short run if the price changes and the market will soon be reflected in market prices, if \( b_{ij} = 1 \), the integration of the market in the long run, if the price is fixed
or stable over time, which is not disturbed by the influence of local stochastic.

\[ p_{it} = p_{it-1} \] and \[ U_{it} = 0 \text{ untuk semua } t \] \( \ldots(7) \)

Monke and Petzel regression model as follows:

\[ P_x = a + b P_y \] \( \ldots(8) \)

where:

- \( P_x \) = the price of rice in the local market (Konawe, South Konawe, Bombana and Kolaka)
- \( P_y \) = price of rice in the market center (Kendari)
- \( a \) and \( b \) = parameters.

Finally, if the two markets are independent of each other, the movement of prices in the two markets will be scattered at random (random), or are not related to each other, so the market is not integrated. It will be marked with a coefficient \( b \) that is not statistically significantly different from zero conversely, if the value of the coefficient \( b \) is statistically significantly different from zero, this indicates a dependency between the two prices in the local market and the consumer market or wholesale market.

4. Data Analysis and Results

4.1 Integration level Analysis of the rice market

To measure the degree of integration of the rice market in this study uses data on average price of rice / rice per month during the period 2004-2008. The results of data processing rice market integration in Southeast Sulawesi as follows:

Table 1: Test Model Ravallion Rice Market Integration in Southeast Sulawesi

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables</th>
<th>H,Kw</th>
<th>H,Kst</th>
<th>H,Bt</th>
<th>H,KL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constanta</td>
<td></td>
<td>141.7</td>
<td>121.5</td>
<td>124.4</td>
<td>126.1</td>
</tr>
<tr>
<td>HrKt-1</td>
<td></td>
<td>0.107</td>
<td>0.132</td>
<td>0.019</td>
<td>0.059</td>
</tr>
<tr>
<td>HrKst-1</td>
<td></td>
<td>0.171</td>
<td>0.072</td>
<td></td>
<td>0.096</td>
</tr>
<tr>
<td>HrKSt-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.024</td>
</tr>
<tr>
<td>HrKL t-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remarks:

- \( H_r \), \( K_w \) = market price of rice in the center of Kendari at \( t \)
- \( H_r \), \( K_s \) = price of rice in the local market in year \( t \) Konawe
- \( H_r \), \( K_s \) = price of rice in the local market in year \( t \) South Konawe
- \( H_r \), \( B_t \) = the price of rice in the market Bombana in year \( t \)
- \( H_r \), \( KL \) = price of rice in the local market in year \( t \) Kolaka

Table 1 shows the price of rice in the local market area Konawe not integrated with the market price of rice in the center of Kendari \( (H_r, K) \). In accordance with the criteria in the short term Ravallion coefficient \( b < 1 \) means the market is not integrated. Or the value of \( b, c \) coefficient \( H_r = 0.11 \). While the effect of rice prices on the market one month lag Kendari center \( (H_r, K_t) \) is not integrated with the price of rice in the local market Konawe indicated by coefficient \( K_w, H_r = 0.170 \). Similarly, the price of rice in the local market in South Konawe \( t \) \( (H_r, KS_t) \) is not integrated with the market price of rice in the center of Kendari \( (H_r, K) \). This is shown KSIT coefficient \( H_r = 0.131 \). While the market price of rice in the center of Kendari \( (H_r, K) \) is not integrated with the price of rice in the local market South Konawe lag of one month \( (H_r, KS_{t+1}) \) is characterized by coefficient value \( = 0.072 \).

The price of rice in the local market Bombana \( (H_r, B) \) is not integrated with the market price of rice in the center of Kendari \( (H_r, K) \) which is characterized by the coefficient \( = 0.020 \). While the price of one month lag in the central market of Kendari \( (H_r, K_{t+1}) \) is not integrated with the price of rice in the local market Bombana \( (H_r, B_{t+1}) \) is indicated by the value coefficient \( = 0.096 \). Similarly, the price of rice in the local market Kolaka \( t \) \( (H_r, K) \) is not integrated with the market price of rice in the center of Kendari \( (H_r, K) \) indicated by coefficient \( = 0.059 \). While the price of rice in one month lag Kolaka \( (H_r, K_{t+1}) \) is not integrated with the market price of rice in the center of Kendari indicated by coefficient \( = 0.024 \). Not integrated with the rice market in Kendari Konawe local markets in the region, South Konawe, Bombana and Kolaka caused by local economic conditions uncertain, crop failure, and pricing information at the farm level is not perfect. In addition, market centers Kendari very open and spacious, so the price can be affected by various regions, especially South Sulawesi.

4.2 Estimated Effect of Price in Market Center (Kendari) Against Rice prices in the local market Konawe, South Konawe, Bombana and Kolaka

1. \( H_r, K_w = 87.26 + 0.153 H_r, K \). (Estimated market price of rice in Kendari in the price of rice in the market Konawe). This indicates that the value coefficient \( H_r, K \) (the market price of rice in Kendari statistically significantly different from zero of \( = 0.153 \). Thus the situation based on the criteria Monke and Petzel proficiency level to the two markets is independent of each other. It means that price movements in both markets spread randomly or not related to each other. Based on the level of proficiency of the rice market in Kendari Konawe rice market is not integrated. Another indication that a decrease or increase in the market price of rice in the center of Kendari not immediately known at the level of the rice market in Konawe.

2. \( H_r, K_s = 53.52 + 0.247 H_r, K \). (estimated market price of rice in the center of South Konawe Kendari market). Coefficient \( H_r, K \) (the market price of rice in Kendari) statistically is not significantly different from zero \( = 0.247 \). This situation Monke and Petzel criteria into two markets are independent of each other. With him that the two market price movements to be scattered randomly which means it does not integrate. This is caused by the increase in the price of rice is not harvest season. Another indication that the rise in the price of rice is not followed by the operation of the market to prevent a rise in the price of rice is higher in the free market.

3. \( H_r, B = 101, 01 + 0.089 HRK \). (Estimated market price of rice in the market center Kendari Bombana). HRK coefficient values (market price of rice in Kendari) were not statistically different to zero \( = 0.089 \). Based on the criteria Monke and Petzel to two markets, namely the central market...
Kendari market Bombana independent of each other. This means that the movement of the price of rice in both market will spread randomly (random) or not related to each other. Other indications show that the increase / decrease in the price of rice in the market were not immediately known in Kendari farmer or local market.

4. $H, K = 37.81 + 0.301 H, K$ (Approximate prices in the market with a huge market center Kendari Kolaka). Based on the value of the coefficient to HRK or the price of rice in the market in Kendari were not statistically different with zero or $= 0.301$. Thus the market into two independent of each other.

To that end, the movement of prices in the two markets will be scattered randomly, so it is not connected rice market in Kendari to the rice market in Kolaka. The unconnected of the two markets, suggesting that the lack of perfect information price for the local market or the market rate at the producer level rice (farmers). In addition, the market is not integrated because rice offer is not in the same position with its requests. For those reasons, price support, price subsidies, fertilizer, and irrigation investment and technology application and maintain the domestic rice price equal to the world price. This turn rice prices at the consumer level are equal to the price of rice at the producer level.

5. Discussion

Based on the calculations and statistical tests of the rice market in Kendari Main Market with Local Market Konawe, Konsel, Bombana and Kolaka not integrated. Changes in the price of rice in the Central Market are not accompanied by changes in prices in the local market. In addition, information about the market price of the parent is not directly known in the local market. There is integration of wholesale markets and the domestic market due to the increase in rice prices in the wholesale market as a producer of rice farmers while experiencing famine or crop failure. By fixing the price at the producer level and at the consumer level with the market mechanism would in turn affect market integration. According to Yogi (1996), enforcement of the price at the farmer’s producer price policy and legal one price effect on market integration. Furthermore, Taufik (2001) is not integrated with the market as a result of changes in the market price of the center at the same time does not affect changes in prices in the local market. Similarly, price formation policy becomes ineffective. This is the strength of market demand and supply, which in turn the local market, retail market, and the market price is not the center of the case. In the short term at the central market prices affect the price in the local market, but the long-term price changes in the wholesale market price changes in the local market showed a positive association, but not integrated.

Wholesale market conditions do not affect the formation of prices in the local market there are some retailers who fled the market without going through the wholesale market. Another indication that there is some retail markets capable of being sub-carriers which assist in the distribution of rice at the consumer level. This situation indicates that there is an association in the local market price and the price of rice in the wholesale market price shows the relationship between two mutually independent. In line with the results of Rahman in the rice market in Aceh shows that the price of rice in months t and t-1 in the local market Piddie market price of rice in North Aceh are not integrated. This is because the extent of the market in Aceh Pidie, transport and communications, as well as rice production is relatively large. In addition, other factors that affect the market Pidie not integrated with the rice market in North Aceh is the price of rice in Aceh Pidie and the price of rice in North Aceh strongly influenced by this mold rice in Medan and Banda Aceh. But on the other hand the results of this study concur with those of Manat Rahim (2003) in the northern coast of West Java and Jakarta Cipinang’s wholesale market. Monke and Petzel criteria based on the research findings showed that the local markets of Indramayu, Cirebon, Subang and Karawang independent of each other. This means that the movement of prices in the local market and the central market Cipinang spread randomly (random) or not connected to each other, in other words, the two markets are not integrated.

On the other side of rice price changes in the wholesale market and the local market led to the structure of the balance of the rice market in consumer and producer level. Price balance between consumer prices and producer prices will affect the price formation process. It is the determination of the price of rice in the local market with controlled mechanism is influenced by the market price of rice in the Parent. Taufik’s research results (2001) showed that the price of rice in months t and t-1 in the OIC, Mura and Hoku district in South Sumatra significantly affected by the price of rice in the city of Palembang. This indicates that the rice market in the OIC, MUBA, MURA and Hok integrate with each other. It means that the change in the in Palembang rice price may affect the price in the local market in the OIC, MUBA, MURA and HOK. Instead of changes in the price of rice in four districts of rice can be followed by changes in the price of rice in the city of Palembang. This indicates that the information between the market price at Palembang as the wholesale market and the market of the four districts as the local market is perfect. Further research Taufik explained that the rice commodity market participants respond to changes in the price, not the price variable in the province of South Sumatra causality.

Associated with survival in the case of rice producers, rice farmers market forces in terms of the formation of price changes at the level of the local market to be one of the factors creating market integration. Meanwhile, the government's rice policy has a considerable influence on the situation of the rice market in Indonesia. In particular, Solahuddin, (1998), saw the price of rice by government policies can integrate rice market at the consumer level and the market at the producer level. The integration of the rice market in the long run directly stimulates manufacturers to produce rice increased.

6. Conclusions

The relationship between the price of rice in the local market in the region Konawe, Bombana, South Konawe and Kolaka
with the price of rice in the consumer market Kendari not associated with each other (independent). This means that changes in market prices of rice in the center of Kendari no effect on the local market. In other words, that the increase or decrease in the market price of rice in the center (Consumer) Kendari is not accompanied by changes in the price of rice or wheat in the local market. Thus the central market by Kendari Konawe local markets in the region, Bombana, South Konawe and Kolaka not integrated.

In order to create unity between the market price of the center (the consumer) and the necessary expansion of the local market price information directly to producers of rice or rice farmers and agricultural commodity prices prevailing every month so that the base price of grain and rice prices do not fluctuate roof. Finally, to ensure the survival of farmers and their families as a rice producer of commodities to meet the insurance needs of crop failure.

References


