Price Formation In Agricultural Prices

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Abstract—**Farmers as price takers face two uncertainties include price risk and efficient cost input. Both farmers and traders alike want to maximize profits with the production cost and minimum risk. This situation underlying the conceptual study of random effects on agricultural prices became attractive.**

Research finds out in farm gate price, the random effects of agricultural commodity prices determine the distribution of sales prices and input prices in the market structure with imperfect competition. This paper is structured as follows the price spread between farm and retail levels which is constituted by mark up or mark down pricing behaviour, namely as threshold behaviour with time lag t-1 and t-2 in red chilli comodity price, as a empiric case of study in West Java Province, Indonesia.

Price incentive which comes up from price spread generates the new technology set farmers can adopt the new least cost technology. The price spread occurs in asymmetric way as threshold behaviour of random effects between farm gate price and retail price, established the incentive for farmers to seek new least cost technology.

Keywords—*price spread, random effect, least cost technology, red chilli.*

I. INTRODUCTION

The nature of perishable agricultural commodities led to uncertainty how much crop to be sold based on what price agreed harvest farmers with traders on the exchange at every point of the chain of agricultural commodity marketing. Most agricultural products have inelastic demand. This makes the prices of agricultural products have a considerable price variation as a signal indicative of agricultural commodity prices at the retail level.

At the time of harvest is successful, then the production increased, but the price tends to fall very sharply. While at the time of harvest less successful, the production decline and prices tend to skyrocket. What are the consequences of the acceptance of the farmers? If the commodity being sold have an elastic demand, the acceptance of the farmers will change in line with changes in the number offered. If the demand for commodities sold have inelastic demand, acceptance farmers will turn in the opposite direction to the change in quantity supplied.

Because most agricultural products have inelastic demand, then the acceptance of farmers tend to turn in the opposite direction with the change of the harvest. When the harvest is plentiful, then the acceptance of farmers inclines to drop, because the interests of farmers and consumers interests contrary to rear, i.e. in any crop failures caused food prices soaring and increased farmer acceptance but lead consumers to complain. However, especially for horticulture crop failures caused crop prices soaring and consumers complain, however, farmers do not enjoy horticultural crop price increases in certain commodities. Horticultural crop price increase enjoyed by wholesalers and retailers.

The influence of excessive / lower demand at the retail level indicated on the wide price gap between the price received by farmers at retail price. Consumers receive information of high price / low prices derived from the merchants. Effect of low prices at the consumer level are transmitted to farmers so that Farmers decided to reduce the supply of crops. While the influence of high prices at the consumer level is not rapidly transmitted to farmers to improve yields response. As a result, farmers experiencing uncertainty crop prices and the customer receives the selling price is uncertain.

In developing countries, such as Indonesia, the interests of subsistence farmers who have limited land, the Government provides policy support and incentives to protect farmers to continue producing while buying crops as consumers. The existence of a random effect on agricultural prices that causes price asymmetry, so for the benefit of policy makers need to study the response of farmers to the random effects of price behavior. which influences agricultural production and marketing decisions.

The price received by farmers is transmitted as a price signal at the retail level, and conversely, the price of horticultural commodity sales at the retail level is transmitted as a purchase price signal at the farm level. The retail price level was formed based on the pattern scale retail price in two planting seasons, while in mark-up, the pattern of magnitude price level farmers in two planting seasons determine the amount of the price at the retail level.

Therefore, the market forces that influence the formation of prices through mark-up pricing is based on the costs of farming that occurs in red chilli as selected horticulturalcommodities.

II. THEORITICAL FRAMEWORK AND MODEL

A. Theoritical Framework

The phenomenon of agricultural commodity prices in the short term as indicated by the behavior of the spread of price, a reference resource allocation decisions or factors of production, namely land, labor and fertilizer and pesticides, as well as decisions about the intensification of production per growing season. In practice, random effects of price determine technical change in agriculture in different paths. A rise in the price of one factor relative to others will induce technical change that reduces the use of certain factor relative to others. Agricultural commodity markets face different levels and differences over time generally creates a gap in commodity prices and market equilibrium price.

The demand for vegetable commodities is generally very sensitive to changes in product freshness. Meanwhile commodities generally relatively quickly rotten vegetables that farmers and traders are not able to hold sales for too long in order to regulate the volume of supply in accordance with the needs of the market, because it can have an impact on the selling price decline caused by a decrease in product freshness.

The consequence is that the supply volume settings that are tailored to the needs of consumers is not easy to do because after harvest, farmers tend to sell crops soon so that the vegetables are marketed still in a fresh state [1]. In general, fruit quality grade A and B are marketed through modern market, while the grade below him and the rest of the sort marketed through traditional markets, making it affordable by all consumers from different economic groups [2]).

This type of product is also a variety of vegetables sold its quality, even some non-conventional products, such as organic food products, pesticide-free, minimum pesticide, and more. The use of pesticides is generally quite high in the central areas of horticulture. By watching the market segment of a typical, nonconventional agriculture (organic / free pesticide / pesticide minimum) can be applied to farm products of high economic value crops [3].

The movement of horticultural commodity price transmission in the short term tends to experience instability due to the perishable nature and the inelastic nature of agricultural commodity demand and supply. In a perfectly competitive market, symmetrical or asymmetrical price transmission at the retail level determines prices at the farm level, because farmers accept prices set by retail or wholesale traders. Farmer-level prices are a key input price factor or prevailing market price at the retail level and / or wholesale level.
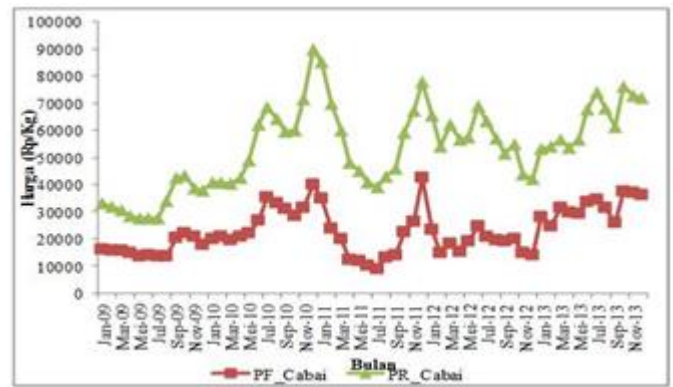

Figure 1. Price at Farm Gate and Price at Retail of Red Chilli

Note: PF_Cabai = Red Chilli Price at Farm Level ; PR_Cabai = Red Chilli Price at Retail Level; Bulan = Monthly Data ; Harga = Price at Rupiahs/Kilograms.
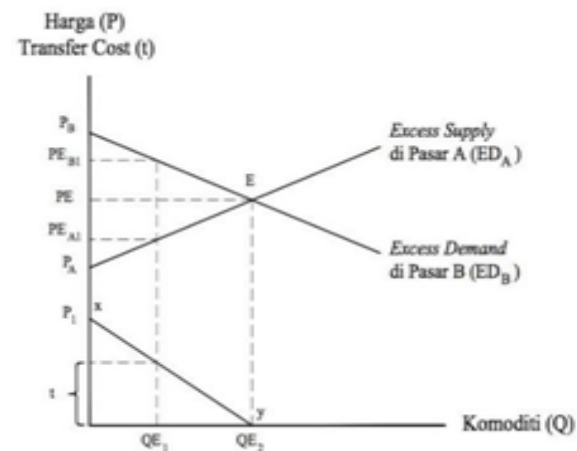

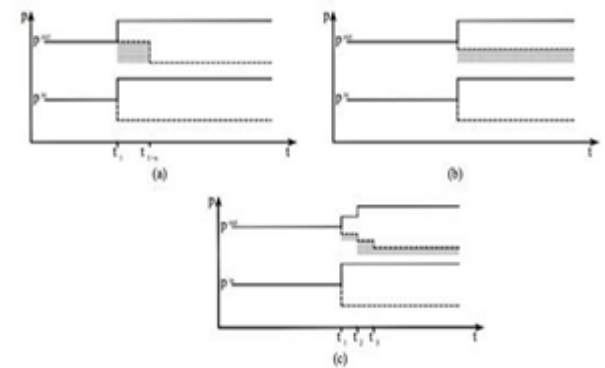Figure 2 Transmission Price Model and Transfer Pricing

Figure 3 Speed of Adjustment Price and Magnitude Asymmetric price

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Price movements as a commodity system involve several types of economic balance relationships between the two market levels [4].

Horticultural commodity markets in the situation of asymmetrical price transmission in this study conducted a price asymmetry test where changes in commodity prices at the farm level and at the retail level are not homogeneous.

This nonlinear price behavior is called the threshold behavior or threshold model, which requires an estimation of the process of adjusting price balances in the long run.

B. Model

The price transmission calculated on the elasticity figure is the selling price of the balance at the farm level. The random effect estimation model, which has been tested by cointegration between two market levels, is used as a reference for margin formation at the trader level.

Formation of prices in the long-term equilibrium suggest the retail level price is formed based on the pattern of retail price quantities in the two growing seasons, while on a margin, the pattern of magnitude at farm prices level in the two planting seasons determines the amount of prices at the retail level.

Monthly data from January 2013 to December 2013 for farm price and retail price were collected from certain 15 red chilli farmers in West Java Province (2013). Farm retail price spread can be further seen as an aggregate of marketing costs and profits. Ferris (1998) suggests that the price spread is equal to the equilibrium of demand and supply of marketing services and material per unit of product, where marginal value of marketing costs per unit of product is equal to marginal cost.

To simplify the equilibrium procedure, the conceptual model of mark up pricing function can be expressed as:

Spread(Retail)= $f(\beta_0, \beta_{1(t-1)}, \beta_{1(t-2)}, \beta_{2(t-1)}, \beta_{2(t-2)}, \beta_{3(t-1)}, \beta_{3(t-2)})$.

The cause of price asymmetry in addition to structural breaks is also due to market power, therefore, it is important to study horticultural commodity market power through price transmission elasticities or price changes. Tomek and Robinson 1991 stated that, "the price elasticity of supply is defined in an analogous manner to the price elasticity of demand . because an increase in quantity supplied is normally associated with rise in price . as is the case with demand functions, the elasticity coefficient typically varies in magnitude along with the supply function. "The elasticity of price transmission referred to in this study is the change in farmer price to the retail level that is dynamic in the long run with correction in short-term price changes [5].

III. RESULT and DISCUSSION

The retail price of red chilli in period t is formed by the sum of mark up the price of variable constants of 0.55 (or 55%) and the spread between the price at the farm level and at the retail level of 1.0001988 (or 100.1988%), the total mark-up 155, 1988%. The behavior of the threshold utilize random effect coefficient prices at the retail level and the level of farmers. Each of these farmers and retailers enjoy price incentives, although retailers enjoyed a greater incentive than the price farmers.

D(Retail) = 0.550647 + 0.032288Retail(-1) - 0.125516Retail(-2) + 0.247334FarmGate(-1) - 0.215935FarmGate(-2) + 1.001988 D(SPREAD)(t-1) - 0.097162 D(SPREAD2(-2).

The behavior of the threshold (threshold) between mark-up and mark-down in the level of producer prices in period t-1 and t 2 is a period of farming incentives enjoyed by farmers as a monopsonist. While the behavior of the threshold (threshold) between mark-up and mark-down at the wholesale level in Caringin market for the period t-1 and t-2 period are the incentives that the wholesaler as a monopsonist.

This means farmers as monopsonist enjoy the incentive of the formation of the retail price of red chilli is in the range between -0.22 when prices fall in the previous growing season and 0.25 at the time of the red-chilli crop price rises in the previous two cropping seasons. The phenomenon of agricultural commodity prices in the short term as indicated by the behavior of the spread of price, a reference resource allocation decisions or factors of production, namely land, labor and fertilizer and pesticides, as well as decisions about the intensification of production per growing season.

Mark up price also indicates the incentives created by the marketing system and decision of red chilli farmers to survive in farming red chilli as well as the ability of farmers at risk when there is a production of pests and diseases.

If the price of retail price goes up relative to farm gate price, indicating that products becomes relatively scarce, technology such as improved marketing services will be developed that can be combined with labor, fertilizer, seeds, and pesticides to increase productions per unit of seasons, as well as lowest cost of production.

IV. RESEARCH IMPLICATIONS

Price incentive which comes up from price spread generates the new technology set farmers can adopt the new least cost technology. The price spread occurs in asymmetric way as threshold of random effects between farm gate price and retail price, established the incentive for farmers to seek new least cost technology.

Farmers gets price incentives to maintain the least cost of technology could affect the transactions costs

both factor and product markets, creating the possibility of differing optimal paths of technical change and of institutional change, depending on farm size or other factors. Transactions costs refer to the costs of adjustment, of information, and of negotiating, monitoring, and enforcing contracts.

Production costs arise because assets are fixed in certain uses in the short run, because there is a lack of perfect information, because there are differences in the ability to use information, and because people are willing to benefit at the expense of others [6]. In practice, random effects of price determine technical change in agriculture in different paths. A rise in the price of one factor relative to others will induce technical change that reduces the use of certain factor relative to others.

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