Economic Analysis on Protection of Farmers' Benefits Based on Market of Agricultural Means of Production and Agricultural Products

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Abstract Influenced by many factors, farmers remain very unfavorable position in market transaction and thus fail to ensure their reasonable benefits. In accordance with basic theory of microeconomics, this paper analyzes mutual relation between market of agricultural means of production and agricultural product market, compares economic decisions of agricultural means of production enterprises and agricultural product circulation service providers in monopoly condition and perfect competitive market, expounds influence of monopoly position of agricultural means of production enterprises and agricultural products service providers on economic benefits of farmers, and elaborates weak position and economic damage of farmers in transaction with various economic entities. Through analysis, it further recognizes necessity for protection of farmers' benefits and puts forward corresponding countermeasures: (1) regulating providers of agricultural means of production; (2) strengthening construction of agricultural product market circulation system; (3) improving organization of farmers; (4) setting up and improving production subsidy system of farmers.

Key words Economic entities, Benefit maximization, Protection of farmers' benefits

1 Introduction

At the same time constant growth of China's GDP, the urban and rural income gap is increasingly widening, and the voice for protecting farmers' benefits is increasingly louder. Such situation has historical, practical, economic and political reasons, but it is undisputable that farmers are weak in the transaction with various economic entities. Using theory of microeconomics, we mainly analyzed market position of farmers in transaction with enterprises of agricultural means of production and agricultural product circulation service providers, and the influence on farmers' benefits. Through analysis, we further make clear the necessity for protecting farmers' benefits, and put forward corresponding countermeasures.

2 Agricultural industrial entities influencing farmers' benefits

Within the framework of market economy, entities influencing farmers' benefits spread all over the links of economic circulation. In this paper, we mainly analyze agricultural industrial entities influencing farmers' benefits. Fig. 1 simply illustrates agricultural industrial labor division and the transaction relationship of farmers with other entities[1]. From Fig. 1, it can be seen that enterprise of agricultural means of production and agricultural product circulation service providers are two important links. These two entities

stay in monopoly position and they occupy larger part of profit in the agricultural industrial chain. In this study, we mainly analyze the influence of these two entities on farmers' economic benefits from the perspective of microeconomics.
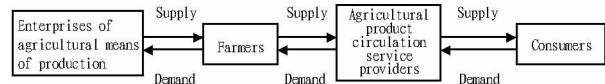

Fig. 1 Agricultural industrial labor division and the transaction relationship of farmers with other entities

3 Monopoly position of enterprises of agricultural means of production and its influence on farmers' benefits

3.1 Factors determining market position of enterprises of agricultural means of production (1) Production, research and development of agricultural means of production have high sci-tech content, and the environment adaptation, environmental protection standard and benefit performance are generally difficult to reach for medium-sized and small enterprises, thus production of agricultural means of production has higher access barrier. This will inevitably lead to monopoly position of enterprises of agricultural means of production. (2) The demand of farmers for agricultural means of production is a derived demand[2], which is the same as demand of producers for other production factors. Farmers purchase means of production and get benefit therefrom, which partly depends on demand of consumers for products produced by farmers. However, farmers who purchase agricultural means of production for necessity of production are extremely separate. As a result, providers of agricultural means of production become a powerful market force. (3) Agricultural means of production, especially new agricultural machinery and tools, new pesticides,

chemical fertilizers and varieties, has features of quasi-public goods[3], this provides theoretical basis for government interfering with this industry. When government interfering with this industry, some policies will lead to industrial monopoly and it will limit development of some enterprises that have no special benefit relationship with government.

3.2 Decisions of enterprises of agricultural means of production for profit maximization

The decisions of enterprises of agricultural means of production for profit maximization can be illustrated by Fig. 2(a). The quantity Q_1 and price P_1 determined by E_1 refer to the quantity and price of agricultural means of pro-

duction determined as per $P = MC^{[4]}$. However, since enterprises of agricultural means of production remain in monopoly position, they can set monopoly price. According to decision principle of profit maximization of $MR = MC$, the quantity Q_2 and price P_2 determined by E2 are the optimal quantity and price of monopoly enterprises. Relatively to a perfect competitive market, enterprises of agricultural means of production occupying monopoly position can increase price of agricultural means of production through reducing quantity of agricultural means of production, to obtain monopoly profit.
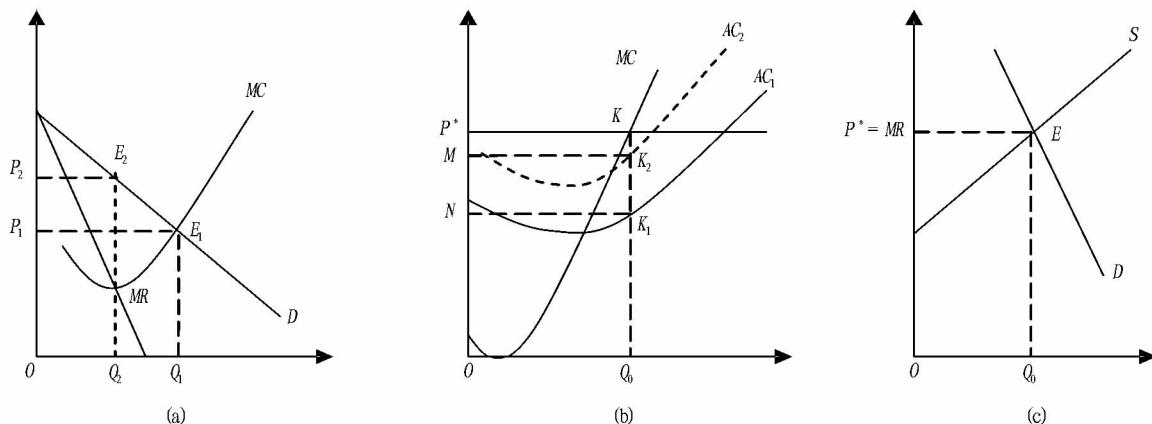
Note: (a) Profit maximization decisions of enterprises of agricultural means of production; (b) Income maximization decisions of farmers at perfect competitive agricultural product market; (c) Balanced price at perfect competitive agricultural product market.

Fig. 2　Analysis on profit maximization decisions of enterprises of agricultural means of production and farmers' benefits

3.3 Influence of monopoly position of enterprises of agricultural means of production on farmers' benefits

Economic relationship between farmers and enterprises of agricultural means of production mainly happens at the agricultural means of production market. To more visually assess the influence of monopoly position of enterprises of agricultural means of production on farmers' benefits, assume agricultural means of production market is a perfect competitive market, and except price of agricultural means of production, the price of other costs for agricultural production is not changed. We firstly assess farmers' benefits when agricultural means of production is priced as per $P = MC$. As shown in Fig. 2 (b), AC_1 signifies the average cost curve of agricultural products produced by farmers when agricultural means of production is priced as per $P = MC$. It corresponds to price P_1 of agricultural means of production determined by E_1 in Fig. 2(a). Since agricultural product market is assumed to be a perfect competitive market, the market price of agricultural product is P^* shown in Fig. 2 (c), and $P^* = MR$. From the profit maximization principle of $MC = MR = P^*$, it can be known that profit of farmers is the area $P^* KK_1 N$ in Fig. 2(b). Then, we assess the influence of monopoly pricing action of agricultural means of production on farmers' benefits. Since we assume except price of agricultural means of production, the price of other costs for agricultural production is not changed, the change of price of agricultural means of production can be expressed in change of AC curve. Enterprises of agri-

cultural means of production are monopoly enterprises, so it is impossible for the price of agricultural means of production to be P_1, but rather it will inevitably be P_2. If AC_2 curve represents the average cost curve for production of agricultural product when the price of agricultural means of production is P_2, farmers' economic profit will be the area $P^* KK2M$ in accordance with the profit maximization principle. Therefore, in the condition of monopoly of agricultural means of production market, farmers' benefit loss is the area $MK2K_1 N = P^* KK_1 N - P^* KK_2 M$. Such loss is just resulted from market monopoly of enterprises of agricultural means of production. The cost $\int_0^{Q_0} (AC_2 - AC_1) dQ$ increased by farmers in the process of production will be changed to profit of enterprises of agricultural means of production.

4 Monopoly power of agricultural product circulation service providers and its influence on farmers' economic benefits

4.1 Market position of agricultural product circulation service providers

Special function of agricultural product circulation service providers determines their market position. On the one hand, it is very difficult for farmers to get around circulation service providers and directly sell products to final consumer goods market. On the other hand, final consumers also difficultly get around circulation service providers to buy products. Thus, circulation service providers stay in monopoly position not only at agri-

cultural product purchase market[5], but also at the final consumer goods market. Circulation service providers reduce farmers' market search cost and transport cost through application of specialized service and modern logistics technology. In addition, circulation service providers strengthen their monopoly position at agricultural product purchase market with the aid of the scale economic effect[6]. Apart from scale economic effect, the monopoly position at agricultural product purchase market is also influenced by farmers' selection action.
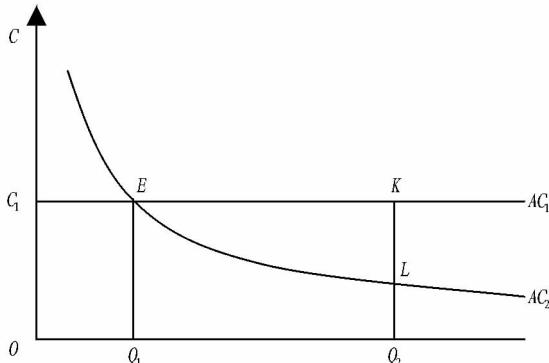

Fig. 3   Farmers' search cost and scale economy of circulation service providers

As shown in Fig. 3, the average sales cost of farmers is AC_1. Due to scale economic effect, the average cost of agricultural product circulation providers is AC_2, showing a declining trend. When the scale of agricultural product circulation providers is less than Q_1, due to $AC_1 < AC_2$, the operating cost of agricultural product circulation providers will be too high, they will lack competitive power, and farmers will sell agricultural products by themselves; when the scale of agricultural product circulation providers is Q_1, $AC_1 = AC_2$, agricultural product circulation providers will appear; if $AC_1 > AC_2$, the circulation service of agricultural products will be provided by circulation service providers, while farmers will exit from circulation field and engage in production of agricultural products.

After appearance of specialized agricultural product circulation providers, the dependence of farmers on agricultural product circulation providers will become higher. Through bringing down sales price of agricultural products, agricultural product circulation providers can obtain higher profit. However, such right of agricultural product circulation providers is limited, and it is influenced by farmers' selection action. As shown in Fig. 3, its marginal profit obtained in Q_2 is KL, and the total profit is the included area between AC_1 and AC_2. This is the highest profit that can be obtained at this purchase amount. When the marginal profit is higher than KL, farmers will organize sales by themselves.

4. 2   Profit maximization decisions of agricultural product circulation providers and their influence on farmers' benefits

To simplify analysis, assume the operating cost of circulation service providers is zero (although this case is impossible, it does not influence the tenability of related conclusions). Fig. 4(a) and 4(b) separately illustrate market demand curve of agricultural products and farmers' production cost curve. Agricultural product circulation providers stay at monopoly position at final consumption market of agricultural products. The market demand curve faced by circulation service providers shown in Fig. 4(c) is the market demand curve D of agricultural products shown in Fig. 4(a). Since the operating cost of circulation service providers is zero, operating cost of circulation service providers shown in Fig. 4(c) is the production cost curve of agricultural products shown in Fig. 4(b), and operating cost of agricultural product circulation providers completely copies production costs of farmers. Relying on monopoly position of purchase of agricultural products, agricultural product circulation providers finally become providers of agricultural product market. According to MR = MC profit maximization principle, market sales price of agricultural products and quantity determined by agricultural product circulation providers are P_1 and Q_1 corresponding to point E in Fig. 4(c). Agricultural product circulation providers have many pricing methods, but this pricing method will bring them maximum profit, and the monopoly profit obtained by them is the area P_1EGP_2 shown in Fig. 4(c). The agricultural products with quantity of Q_1 are purchased from farmers at price of P_2. If farmers can organize them effectively, this part of profit can be owned by farmers.

5   Necessity and countermeasures for protecting farmers' benefits

5. 1   Necessity for protecting farmers' benefits   Through the above analysis, we can see clearly that farmers stay in extremely weak position in market transaction. Especially, farmers have no pricing right when purchasing agricultural means of production, and lack negotiation chip when bargaining with agricultural product circulation service providers, so they fail to protect their reasonable benefits. In China, farmers take up 60% of the total population, thus protecting farmers' benefits and refraining damage of other economic entities to farmers are a top priority.

5. 2   Countermeasures for protecting farmers' benefits

5. 2. 1   Controlling providers of means of production. Firstly, it is required to realize that production of agricultural means of production has strong positive externality. If economic benefits of producers fail to be fully compensated, their enthusiasm for production will be dampened. As a result, it will lead to short supply of agricultural means of production. In worse condition, it will restrain technological progress of agricultural production. Therefore, it should set up and improve various patent systems, and subsidize production, research and development enterprises. Secondly, due to protection of patent system and limitation of various technological standards, the production of agricultural means of production has higher technological barrier, and manufacturers can form monopoly force with the aid of such barrier. Without control over this monopoly force, it will definitely damage farmers' benefits and influence farmers' application of advanced means of production. Thus, on the condition of keeping reasonable profits of enterprises of agricultural means of production, it should take certain control

over the price of agricultural means of production they sell.
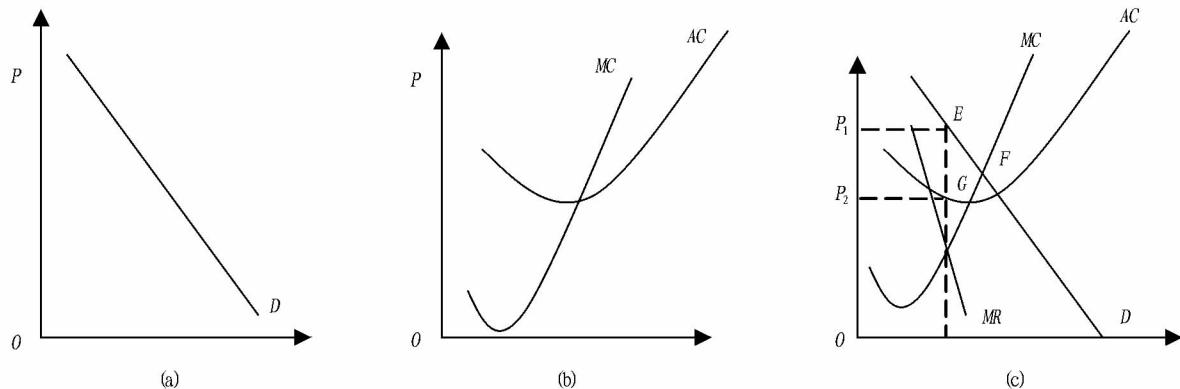
Note：(a) Market demand curve of agricultural products；(b) Farmers′ production cost curve；(c) Profit maximization decision of circulation service providers.

Fig. 4   Analysis on profit maximization decisions of agricultural product circulation service providers and farmers

5.2.2   Strengthening construction of agricultural product market circulation system. Only through establishing perfect agricultural product market circulation system, can strengthen competitiveness of circulation field, and can change farmers' market position when selling agricultural products. At first, it should strengthen infrastructure construction of circulation field, to provide favorable sales condition for farmers. Besides, it should issue price information of agricultural products, to facilitate farmers' sales of agricultural products at fair price.

5.2.3   Improving organization degree of farmers. Strengthening organization degree of farmers can increase power of farmers in negotiation with various transaction entities. At present, the representative organization form includes " company + farmer household" and "company + community + farmer household" , as well as specialized cooperatives set up by farmers. Comparatively speaking, these organizations are easily established, but farmers are still in weak position. In comparison, cooperatives set up by farmers are relatively separate, and their development process is slow. Therefore, organization of agricultural producers should suit local conditions and advance gradually.

5.2.4   Establishing and improving production subsidy system for farmers. Farmers bear large part of the cost for agricultural production, while considerable amount of income created by agricultural production flows to enterprises of agricultural means of production and agricultural product circulation service providers.

Thus, it must establish and improve subsidy system for farmers. Firstly, it is required to increase direct subsidy for agricultural production, increase cross and middle links, and increase fund utilization efficiency. Secondly, it is proposed to adjust structure of agricultural subsidy, increase subsidy for fine seed, increase scope and variety of subsidy, and increase comprehensive subsidy for agricultural means of production. Thirdly, it is recommended to pay close attention to performance evaluation of subsidy funds, and establish hard budget constraint system of subsidy funds, to prevent embezzlement of subsidy funds.

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