Analysis of the Theory of Intermediaries and Firm in Rural Socialized Service Organizations

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Abstract  We use Sperber’s intermediaries and the firm theory to analyze the rural socialized service organizations. By studying the case of the melon association in Beihe Village of Liqiao Township in Beijing, we find that the basic existing objective of this association is to save transaction cost. The theoretical research and case analysis results show that the dispersed peasants are unable to solve the contradiction between small-scale production and large-scale market. However, the rural socialized service organizations, the purpose of which is to serve the benefit of the peasants, can save the transaction cost of peasants and safeguard the economic interests of the peasants.

Key words  Intermediaries and the firm theory; Socialized service; Transaction cost; China

In 2006, the Central Committee of the Communist Party of China and the State Council brought forward the concept of rural new socialized service organizations in the document of Suggestions on Promoting the Construction of New Socialist Countrysides. It was mentioned in Article 29 of the document that “To cultivate rural new socialized service organization, we should encourage, guide and support the development of various new types of socialized service organizations in rural area, promote the development of farm product industry association, guide agricultural workers and agricultural products processing and export enterprises to strengthen industry self-discipline, to do well in information service, and to safeguard the member’s right. We should encourage intermediaries in the fields of law and finance in rural areas to provide effective service for the development of production and management and the maintenance of legal rights of peasants.” The concept of rural new socialized service organizations mentioned above is equal to the rural socialized service organizations in both connotation and extension. The word “new” only emphasizes the function in new countryside construction, and is another expression of the word “new”. Rural socialized service organization, in essence, is a peasants’ spontaneous non-profit organization and an intermediary connecting market and society.

1 Intermediaries and the firm theory

Sperber advances the intermediaries theory of the firm in the Microstructure of the Market. The firm, in this theory, is interpreted as the intermediaries between consumer and supplier. Compared with the direct transaction between consumer and supplier, the transaction by intermediaries brings more benefit. Thus, the firm comes into being.

1.1 The basic intermediaries model

The firm, a businessman or an organization, sets purchasing price and selling price and carries out the activities of purchase and sale. Its aim is to clear the market. Therefore, both the purchasing price and selling price reflect the problem of goods in stock, that is the problem of unsatisfied demand cost due to excessive or insufficient stock.

We assume that $p$ is the asking price of a firm, $w$ is the quoted price to supplier, supply-demand function is differentiate.

Flexibility of demand function:
$$\eta(p) = \frac{-pD'(p)}{D(p)}$$

Flexibility of supply function:
$$\xi(w) = \frac{-wS'(w)}{S(w)}$$

For convenience, it is assumed that the firm neither bears transaction cost, nor reprocesses the product. It only sets price and makes the sell out cheaper than the purchase. Here we have:
$$D(p) \leq S(w).$$

The profit function of the firm is
$$\Pi(p, w) = pD(p) - wS(w).$$

The firm selects asking price $p$ and bid price $w$ in order to achieve profit maximization under the restriction of equation (3). The first derivative is obtained for the asking price and bid price in equation (4):
$$p^* - w^* = \frac{\eta(p^*)}{\xi(w^*)}$$

$$Q^* = D(p^*) = S(w^*)$$

Where $p^*$ and $w^*$ are the asking price and bid price set by the firm in order to clear the market, $Q^*$ is trading volume. Hence, the profit of monopolistic intermediaries is the difference between asking price and bid price, then multiplied by sales volume:
$$\Pi(p^*, w^*) = (p^* - w^*)Q^*.$$
The optimum asking price and bid price for intermediaries are shown in Fig. 1:

Fig. 1 The basic intermediaries model

1.2 Intermediaries and the firm theory

A simple economy has only one consumer and supplier (or another consumer). The supplier has one unit product needed by the consumer. The opportunity cost of this product by supplier is $C$. The willing payment of the consumer for this product is $V$. The transaction cost of the two is $T$. We assume that a positive net benefit is brought by transaction, $V - C - T > 0$.

For convenience, it is assumed that the distribution between consumer and supplier is equal to $\frac{V - C - T}{2}$.

Adding an intermediary, we assume that it can pay the supplier $w$ for the product, and can resell it at the price of $p$ to consumer. The transaction cost of intermediary is $K$. The intermediary competes in the form of direct transaction. The consumer and supplier have the same willingness to pay, and the opportunity costs for direct transaction and the transaction through intermediary are also the same. Obviously, if and only if the transaction intermediary reduces the cost, the transaction through intermediary can happen. In another word, a necessary and sufficient condition for the transaction of intermediary is $K \leq T$.

The independent selection of both buyers and sellers is either direct transaction or the transaction through intermediaries, therefore, non-cooperative game can explain the intervention of intermediaries.

The first stage: the asking price of intermediaries to consumer is $p$, the quoted price to supplier is $w$.

The second stage: according to $p$ and $w$, both the consumer and supplier had two options: the direct transaction and accepting the quoted price of the intermediaries.

The third stage: negotiation is needed between buyers and sellers when choosing direct transaction; the bid price should be accepted when selecting intermediaries.

In the long run, the intermediaries should be responsible for the price undertaking to maintain its credit and to ensure more trading volume, which the buyers and sellers in direct transaction cannot do.

Firstly, assuming that the intermediaries exist, where the asking price is $p^*$, and quoted price is $w^*$:

$$V - p^* = \frac{V - C - T}{2} = w^* - C \quad (7)$$

From equation (7), we have

$$p^* - w^* = T, \quad (8)$$

implying that the gain $p^* - w^*$ of monopolistic intermediaries is entirely equal to the transaction cost $T$.

From equation (8), the profit of intermediaries is

$$T - K = p^* - w^* - K. \quad (9)$$

Hence, as long as $K \leq T$, it is profitable for intermediaries, and its appearance is reasonable.

Secondly, considering the Bertrand price competition among intermediaries, its asking price is $p^c$, and bid price is $w^c$. Competition makes the zero profit of intermediaries, therefore the profit is just equal to transaction cost, which can be written as $p^c - w^c = K$.

Total benefit of both buyers and sellers through intermediaries transaction is $V - C - K$. Under the assumption of equal distribution of both parties, this becomes

$$V - p^c = \frac{V - C - K}{2} = w^c - C. \quad (10)$$

The same as monopolistic situation, if and only if $K \leq T$, it is profitable for intermediaries, and its appearance is reasonable.

1.3 Saving the transaction cost

The existence of firms as intermediaries is to save transaction cost. Through the transaction of intermediaries, there is no need for consumers and suppliers to deal with each other. Thus, both parties economize the searching and traffic costs.

Fig. 2 Comparison of the marketing channels of direct transaction and the transaction through intermediary

Fig. 2 illustrates that, assuming there are three consumers and three suppliers, 9 marketing channels are needed to combine the dispersed transactions between consumers and suppliers together. However, by adding intermediaries, only 6 marketing channels are needed. Generally speaking, if there are $N$ consumers and $M$ suppliers, the cost of each marketing channel is $K$, the intermediaries can reduce the transaction cost by $[N \times M - (N + M) - K]K$.

Besides, the buyers and sellers in direct transaction are isolated in space and time, therefore, continuous searching and bargaining are needed, which is low in probability and huge in cost. As a result, the searching and bargaining might be incomplete. Assuming that the consumers and suppliers make a success transaction at the probability of $\beta$, the cost of direct transaction is

$$T = (1 - \beta) (V - C) \quad (11)$$

If there is no efficiency during the process of searching and bargaining, which causes the low probability of $\beta$ value, the transaction through intermediaries has more advantages.

Hence, the firms appear as a tool to save transaction cost. This kind of saving is achieved not through inner business but by more efficient transaction.
2 Case introduction: accessing to market and protecting their own self-equity by the cooperation of melon peasants

Wang Guangsheng, a professional melon and vegetable farmer, is the leader of Beihe melon peasants association of Liqiao Township, Beijing, a rural socialization service organization spontaneously set up by the villagers. The association has been developing from organizing the information communication of members, negotiating with the transportation and marketing person about price at first to establishing package plant, fresh-preserved storehouse and producing area market, participating in marketing and purchasing.

The benefit loss of melon farmers is severe when entering to the market separately. In the second half year of 1988, melon cultivar Elizabeth was introduced into Beihe Village by Wang Guangsheng. Plant trial succeeded in 0.2 hm². The planting area was soon expanded from 2 to 4 greenhouses. Other farmers in this village began to learn to plant this cultivar. After the opening of vegetable market in 1993, melon and vegetable in greenhouse developed rapidly. However, the market changed in 1996. Firstly, with the enlargement of planting area, the price of melon gradually fell. Secondly, the seeds and film bought by the melon peasants had serious problems in quality. At the harvest period of 1998, pedlar from northeast China colluded with each other to purchase at a lower price. The price of local melon was forced down from 1.20 to 0.90 yuan/kg. Pedlar, as a buyer, greatly deprived the profit that should have belonged to peasants, and the melon farmers suffered from heavy loss.

With the entering of melon cooperation into the market, its negotiation position was improved, and their own market right was maintained. The price squeeze of northeast pedlar caused great loss of melon farmers and made them realize that only by organization, could they protect themselves from pedlar and avoid benefit loss. After urgent negotiation, Wang Guangsheng was elected to organize sale. He then immediately set up the association together with 63 rural households at that night. According to the market information offered by peasants, the lowest price of melon cultivar Elizabeth was 1.70 yuan/kg. The association decided that the asking price at the next day should be more than 1.20 yuan/kg. If could not seal a bargain, directors would sell it to pedlar in Shazhous and other areas of Beijing at the price of 1.25 yuan/kg through their own special connections. Finally, the pedlar from northeast was forced to raise up the price at the next day, and the price rose up to 1.35 yuan/kg. All the melons were sold out after one week.

3 Analysis of the intermediaries and the firm theory in rural socialized service organizations

Sociology believes that socialization is the process of individual integrating into the society. Economics points out that the process of individual integrating into the society can be realized by transaction. Socialization service is the help offered to realize this kind of transaction, and to achieve the goal of economize transaction cost. The main reason for the rural socialized service organizations rooting and developing in rural areas is that the socialized service offered can reduce transaction cost.

3.1 Division of labor, specialization, transaction and transaction cost

Adam Smith, the leading scholar of economics, provides “the greatest enhancement of labor productivity, as well as the better proficiency, skill and judging ability, seems to be the result of the division of labor”, “for all the technics can adopt division, once adopting, the labor productivity can be improved accordingly”.

Why the evolution of labor division can bring the improvement of productivity and the development of economy? The explanation by Smith is: after division, the same number of laborers can finish more work than before. This is because: (1) labor division reduces the times of job switching, and saves labor time; (2) labor division helps the accumulation of professional knowledge and the improvement of operation efficiency (human capital accumulation); (3) the simplification of operating process and the invention of implement make one person can do the works of many people used to (physical capital accumulation).

We hereby gain specialization economy in the economics term. This is the specialization brought by labor division, which increases efficiency. Therefore, specialization is the inevitable result of the development of the social division of labor. It is the action of a person or a organization who reduces the operation species with low efficiency and different functions during production activity, and makes the resources relatively concentrated on more profitable and efficient operations, in order to realize the anticipated profit.

Yang Xiaokai et al argue that transaction cost has great impact on the evolution of labor division and the development of economy. The lower the transaction cost, the higher level of labor division, and vice versa. The production efficiency was low at the initial stage of this division due to the insufficient accumulation of knowledge. Therefore, the society was at the stage of autarky. After a period of learning by doing, the production efficiency improved, more transaction cost could be paid, and people could choose more advanced division of labor and higher professional level. These could further improve the production efficiency and pay for transaction cost. It is a positive feedback. This process causes economic growth eventually.

Undeniably, the division of labor and the specialization are common at modern society. Nearly no one can realize autarky in economy or social demand, nor can they offer all the goods and services they need. In order to acquire these goods and services, they have to deal with each other. Marx points out that transaction is the intermediary factor between the productive and production-decided distribution side and the consumption side. On the one hand, we offer other people specialized goods and services, on the other hand we need other people in the same way. Transaction cost appears in order to realize this type of transaction. The objective for social service seeking by transaction participants is to save transaction cost.
which was far more expensive than 0.90 yuan/kg (bid price $W^*$). The profit is
\[ \Pi(p^*, W^*) = (p^* - w^*) Q^* = (1.70 - 0.90) Q^* = 0.80 Q^* \tag{13} \]

Farmers were aware of the huge price space between 0.90 and 1.70 yuan/kg. And the association, intermediaries for individual peasant and pedlar from northeast China, asked a price of 1.20 yuan/kg ($p$), and represented that they would sell the melon to pedlar in Beijing at the price of 1.25 yuan/kg if there was no conclusion of business. That is to say, the association as intermediaries was farmers’ own organization. The bid price $w$ to melon peasants was 1.20 yuan/kg, which was far higher than the bid price $w$ by northeast pedlar (0.90 yuan/kg). Thus the individual northeast pedlar bid against each other, and the final price was 1.20 yuan/kg. This protected the benefits of melon peasants and cut down the profit space of pedlar,
\[ \Pi(p^*, W^*) = (p^* - w^*) Q^* = (1.70 - 1.35) Q^* = 0.35 Q^* \tag{14} \]

In Sperber’s intermediaries and the firm theory, intermediaries stand for the firm and the same kind of economic organization. The rural socialized service organization belongs to non-profit organization, and has fundamental difference with economic organization. The existing objective of the two, however, is to save transaction cost during the process of economic and social transaction.

Here, Sperber’s transaction cost is consistent with its concept in new institutional economics. The Nature of the Firm, written by Coase in 1937, points out that the definition of transaction cost is the cost for applying market mechanism. Transaction cost includes searching information cost, bargaining cost, decision-making cost and implementing and control cost from the aspect of contract process.

As is mentioned above, we can conclude that different organization forms have different inspiring and restricting functions, which manifests in economic performance. Rural socialized service organizations, such as the Beihe melon peasants association of Liqiao Town, not only save the searching and bargaining costs mentioned in intermediaries theory, but also strive for the profit from melon pedlar, protect the benefit of peasants. Besides, due to the peasants entering into the market in the form of organization, their decision-making, implementing and control costs are greatly reduced. It is the existing objective of melon peasants association. And the association saves transaction cost in this business case.

### 3.3 Numerical example

According to this case, we use the intermediaries and the firm theory to conduct numerical analysis.

Assuming that there is no market monopoly, the market selling price $V$, a price consumers willing to pay, is 1.70 yuan/kg. The opportunity cost $C$ of supplier (melon peasants) is 0.90 yuan/kg. The asking price $p$ of the association to northeast pedlar is 1.35 yuan/kg. And the asking price $w$ of the association to melon peasants is 1.25 yuan/kg as the purchasing price of Beijing pedlar.

The association is a non-profit organization serving for melon peasants, the purpose of which is to provide public service for peasants without profit. The transaction through this inter-
mediaries can happen immediately. Direct transaction, however, has the process of searching and bargaining, which are incomplete. Under the assumption that the probability of transaction price is 50% between supplier (melon peasants) and buyer (northeast pedlar), the direct transaction cost is

\[ T = (1 - \beta) (V - C) = (1.00 - 0.50) (1.70 - 0.90) = 0.40 \text{ (yuan/kg)}, \]

and the transaction cost through intermediaries is

\[ K = p^c - w^f = 1.35 - 1.25 = 0.10 \text{ (yuan/kg)}. \]

Hence, the average benefit of direct transaction between melon peasant and pedlar is

\[ \frac{V - C - T}{2} = \frac{1.70 - 0.90 - 0.40}{2} = 0.20 \text{ (yuan/kg)}, \]

and the average transaction benefit through intermediaries is

\[ \frac{V - p^c}{2} = \frac{V - C - T}{2} = \frac{1.70 - 0.90 - 0.10}{2} = 0.35 \text{ (yuan/kg)}. \]

We can conclude that the payoff matrix of the transaction through intermediaries is as follows:

| Table 1 Payoff matrix of the transaction through intermediaries, yuan/kg |
|-----------------------------|-----------------------------|-----------------------------|
| Pedlar                      | Direct transaction          | Selecting intermediaries    |
| Direct transaction          | (0.20, 0.20)                | (0.00, 0.35)                |
| Selecting intermediaries    | (0.35, 0.00)                | (0.35, 0.35)                |

Hence, the Nash equilibrium solution of both buyer and seller is (0.35, 0.35). Peasants maintain their own interests by selecting the socialized service offered by the intermediaries of association.

4 Conclusion

With the deepening of market economy, the dispersed peasants can not solve the contradiction between small-scale production and large-scale market. However, the rural socialized service organizations, with its purpose of serving the benefit of the peasants, can save the transaction cost of the peasants and safeguard the economic interests of the peasants.

References


农村社会化服务组织的中间层结构与厂商理论分析

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摘要 以斯密尔伯的中间层组织与厂商理论为基础，介绍了基本的中间层模型及中间层的交换能够发生的必要条件，并运用非合作博弈说明了中间层的介入。考虑了垄断市场和厂商价格竞争两种情况下，中间层的条件，分析了作为中间层的厂商在将交易内部化，而是通过有效地进行交易而实现交易成本的节约。在某些情况下，它不仅节约了合理的成本与讨价还价成本，争取到了被挤压的利润，还节约了农民的决策、执行、控制等成本。理论研究和案例分析的结果表明，分散的农户无法解决小生产与大市场的矛盾，作为以服务农民公众利益为宗旨的农村社会化服务组织，在农民进入市场交易的过程中，能够做到为农民节约交易成本，从而维护农民的经济权益。

关键词 中间层组织与厂商理论；社会化服务；交易成本