# Section 2: Wage Contract

The analysis in Section 1 is on the general factor market. In this section, the analysis will focus on the labor market, a specific factor market, which is also applicable to other factors, and the characteristics of labor are most obvious.

Why is labor singled out? As mentioned in Lecture 14, although in neoclassical economics production factors has been divided into capital and labor, the major difference between labor and non-labor is actually not understood. Labor is human with self-will, so there will be different transaction costs if it is organized in production with different contracts. The analysis on the general factor market in Section 1 is the traditional analysis of neoclassical economics without taking transaction cost into account, and it is only correct when the transaction cost is low enough, so the phenomena that can be explained are extremely limited. As for the phenomena that there are different contractual arrangements in seemingly similar production, it is entirely incapable.

One of the most important reasons is whether the transaction cost is low will determine whether the factor market can be separated from the product market. Labor market is a very good example to illustrate it.

Suppose one sits by the street as a shoeblack, is the price paid by a client used to buy the output of shining shoes (product) or the input of the labor (production factor)? The answer is: either! A shoeblack is self-employed and not a firm. In such a case, the product market is obviously inseparable from the factor market.

At the very beginning of Lecture 11, as has been criticized, the traditional producer theory (Theory of Firm) is confused with the Firm Theory in MSE. The traditional producer theory does not actually take the influence of the organizational form of a firm on production into account because there is no the concept of transaction cost in it. In other words, the producer theory only studies the case of individuals self-employed, where the product market is inseparable from the factor market.

In reality, why are there many productions organized through firms stead of market? The reason has been explained in Lecture 14 that under certain constraints the transaction cost of using firms to organize production is less than that of market. In other words, as long as the transaction cost of market is low enough, people will not choose to organize production through firms, so individuals self-employed instead will organize production through market, and the factor market is not separable from the product market.

One may ask: is it because the producers directly face the consumers that the factor market is inseparable from the product market? The answer is NO! The above example of a shoeblack does be the case that a self-employed producer directly faces consumers, but even if it is not the case, it does not mean that the factor market will become separable from the product market. There is another example of “stringing beads”: the self-employed producers stringing beads do not directly face consumers, but sell the beads directly to them through middlemen (agents). In such a case, there are middlemen between producer and consumer, but the factor market is still inseparable from the product market, because the middlemen are in the same position as the consumers of the previous example of a shoeblack. Is the price paid by a middleman used to buy the output of beads (product) or the input of the labor (production factor)? The answer is still: either! The middleman just passes the beads on to the final consumers, and the consumers pay for either the output of beads (product) or input of the labor of those stringing the beads and the middleman investigating the market demand, conveying the information of this demand, transporting the beads to the market, and pricing (production factor). It is logically similar to the wholesale market. Obviously, wholesale market is not factor market, and retail market is not product market, although the buyers in the former are usually middlemen.

The key is that the contract forms are basically the same. When a middleman buys the beads from the self-employed individuals stringing beads, the price is set on a piece-by-piece basis. Similarly, when a final consumer buys the beads from a middleman, the price is also set on a piece-by-piece basis. In other words, the price (wage) of labor, a production factor, is added into the beads on a piece-by-piece basis, which is called “piece wage”.

One may ask: is it because the producer is self-employed that the factor market is inseparable from the product market? The answer is still NO! Just imagine there is a significant technological progress happened in the bead stringing industry, a large machine has been invented to greatly increase the production efficiency. The machine is too large to be set up in a family, so the self-employed individuals stringing beads sit around the machine in a big house to cooperate.

The middleman still buys beads from them on a piece-by-piece basis, but the price may include the rent of the machine and the big house. In fact, when the self-employed individuals work separately in their own homes, the price of the beads includes not only the price of labor price (wage), but also the cost of small tools and the rent of the workplace at home, and just the PPRs of these other factors clearly belong to them. In other words, the self-employed individuals rent out not only their own labors, but also small tools and the working place of their homes.

As for the large machine and big house, to whom the PPRs of them belong depends on the specific constraints. If the self-employed individuals rent the large machine and the big house, the price of beads will include the rent of both, but should be distributed to them according to the proportion of their capital contribution. If they have different production efficiency and capital contribution, this calculation will be very troublesome (implying there is high transaction cost). As a result, in reality, usually it is the middleman who rents the large machine and the big house, so the price he pays for the beads does not include the rent of both. Of course, when he sells the beads to final consumers, the he will raise the price to include not only the wage of his own labor, but also the rent of both. In order to facilitate the self-employed individuals to cooperate, the middleman will probably set up a firm to employ them as workers, but the contract for buying the beads from them is still on piece-by-piece basis. Thus, from the perspective of law, there is a firm, but form the perspective of economics, it is not essential different from the case that the individuals stringing beads are self-employed.

Let us review the example of secretarial service in Lecture 14. The services of a secretary are various and trivial. Although every service can be priced on a piece-by-piece basis in principle, the transaction cost is obviously too high. It is more convenient for the middleman to simply price according to the working hours instead of the quantity of products, which means the wage contract has changed from piece rate time wage. Thus, a final consumer buys the product from the middleman on a piece-by-piece basis, while the middleman directly buys the working hours of the labor, which implies that now the product market is separated from the factor market. From the perspective of economic, there is a firm, and the middleman also has turned to the manager.[^1]

In a word, the key lies not in whether the producer directly faces the consumers, nor in whether the producer is self-employed, but in the form of wage contract. If the contract is on a piece-by-piece basis (such as the wage contract of piece rate), the product market is inseparable from the factor market, regardless whether the price only includes the wage of labor or also includes the rents of other production factors. However, if the contract is not on a piece-by-piece basis (such as the time wage), the product market is separated from the factor market, because in the product market it is the contract on a piece-by-piece basis that set a price for the product, while in the factor market, it is the contract of time wage that set a price (wage) for the labor. As mentioned in Lecture 14, Coase advocates that it is the organization of firm replaces the market system to reduce transaction cost of market, which is actually not accurate enough. The more accurate statement is that it is the factor market that replaces the product market, and the most accurate statement is that it is the contract of production factor replaces that of product.

Think deeply, what a manager really wants to buy is always the products, not the working hours of the workers. Just because the transaction cost of directly pricing the product is too high, he turns to price the product indirectly according to the time. Suppose one can output 10 units of products in an hour, and the price of each unit is RMB1. The piece rate is RMB1 per unit of product, which is the same as that the time wage is RMB10 per hour. The essence of the time wage is to entrust the price of product to the time, because there are many kinds of products or services (such as the service of secretary) with too high transaction cost for pricing on a piece-by-piece basis. If the information that the price of each unit of product is RMB1 and there are 10 units produced in one hour is difficult to know, a manager will turn to use the time wage of 10RMB per hour. However, entrusting the price of product to the time can reduce the transaction cost of pricing on a piece-by-piece basis, but it will also increase another kind of transaction cost that workers will shirk during working hours, resulting in the less output in an hour than 10 units under the wage contract of piece rate. The loss caused by this decrease in efficiency is precisely an increase in transaction cost.

Of course, the manager will take some measures to control the workers. For example, he can require a worker to produce at least 10 units in an hour, or else the time wage will be cut. However, it means the manager still needs to know the information that a worker can produce 10 units in an hour, which is precisely the transaction cost caused by the wage contract of piece rate in such occupation as secretary.

Besides, there is still the problem of quality. A worker may produce 10 units in an hour, but the quality is poor, so he does not work as hard as he does in producing higher quality goods. The loss caused by the decline in quality is also an increase in transaction cost. The manager then has to specify the quality of the product in detail, which also needs to be monitored under piece wage. Under piece wage, only the quantity of products has been specified and monitored, so the workers will tend to increase quantity at the expense of reducing quality. The manager can supervise the workers himself or send someone to do so, but the supervisors need to be paid, which is also an increase in transaction cost.

In conclusion, different forms of contracts (direct pricing or indirect pricing by entrusted to some easy to measure such as time) can reduce some kinds of transaction cost, but will also cause the some other kinds of transaction cost to increase. Self-interested human naturally choose the contract with more transaction cost reduced and less transaction cost increased. In addition to the contracts of piece wage and time wage analyzed above, there are also sharing contracts (such as commission, dividend and bonus), and these different contracts may be used in combination (for example, the contract of time wage and sharing contract are often used in combination).

For any contract, one or several “property” will be chosen as the measure index for direct pricing. For example, in the contract of piece wage, the quantity of products is measured to set price, while in the contract of time wage, the working time is the measure index. The measure cost of these indexes chosen for direct pricing (transaction cost for pricing) must be low. Because they are directly and easily measured, the transaction cost for supervising their performance is also relatively low. However, for those properties that have not been directly measured and priced (such as the quality of products under piece wage and the shirking behaviors of the workers under time wage), the transaction cost for supervising their performance is relatively high, sometimes is so high that the supervision has to be given up, and the transaction cost is the loss in income caused by non-performance. In order to reduce the transaction cost of supervision, properties of direct measurement can be increased, but the transaction cost of measurement will also rise. Self-interested human will choose to increase the properties of direct measurement until the increase in transaction cost of measurement is equal to the decrease in transaction cost of supervision on the margin.

To sum up, when the transaction cost of using the market is low enough, the product market is separable from the factor market. The price paid by the final consumers is either for the product or for the production factor. In other words, the price of the production factor is actually determined by that of product. As an important deduction, the wage of a worker is also determined by the income that the goods he produces can get in the market, not by the manager or boss of the firm. If government intervenes in the labor market, such as implementing the minimum wage law or giving trade unions administrative monopoly power, it actually indirectly intervenes in the product market.

When the transaction cost of using the market rises (such as the measurement cost of direct pricing the product), people will turn to direct pricing by other easily measurable properties of production factor to replace direct pricing, thus separating the factor market from the product market. However, the separation of the two markets does not mean that there is no linkage between the price of product and that of production factor any longer, but just becomes complicated. The price of the production factor (such as the wage of labor) ultimately still depends on the price of the product, so the government interventions in the factor market will eventually interfere in the product market.

The properties of direct measurement and pricing are stipulated by the price clause or income clause in a contract, which is similar to the transaction in the market, and guided by the invisible hand of the market without need of supervision. By contrast, the properties if indirect measurement and pricing are stipulated by the use clause in a contract, which is not guided by the market, so need to be guided and supervised by the visible hand of the manager, thus causing an increase in the internal management cost (the transaction cost of using the firm).

In a word, contract is structural that there are not only price clause (income terms) but also use clause that is used to supervise the prosperities of indirect measurement and pricing.

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[^1]: This imaginary example of significant technological progress happened in the bead stringing industry has a “prototype” in reality -- the industrial revolution. The essence of the industrial revolution is not only the major technological progresses of the inventions of large machines such as textile machines and steam engines, but also the emergence of factory system that replaced the traditional family workshop.