

Title : Principles of Economics

Markets for Factors of Production

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This is the last chapter in dealing with the micro economical issues and in this chapter we will go back to the discussion that we covered 4 or more chapters before.

In the last few chapters we discussed Imperfect competition in the market place, now we will revert back to perfect competition, but we will study the situation in the markets for factors of production.

So we will study the interaction between the input markets and the output markets.

We say that in the market for factors of production, the decisions that companies take is influenced by the situation in the output markets.

We say that the firm's decision to hire labor capital land and other inputs into production depend on the size of market demand for the final good.

So we should think that the company is facing two markets

One is the market for the factors of production and the market for the final good that the company produces.

And the decision to hire an additional unit of labor capital or land depends on how much extra revenue the company can achieve or how much extra profit the company can achieve in the market for the final good.

So here we should think that when the company hires an additional unit of input, it faces a cost of a hiring that unit of input.

And it must evaluate this cost of hiring with the extra benefit of hiring that extra input.

The benefit from hiring an extra unit of input depends on the productivity of that input and on the price of the final food that is produced by that input.

So to review to go back to chapter 13 once again we are assuming a simple relationship between inputs used on outputs produced.

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We are assuming that as more of an input is being used less additional output is produced.

So we are assuming diminishing marginal productivity of all inputs.

And here, the important thing to realize is that company doesn't really care about the quantity of the final good produced.

So it doesn't care about the units on this vertical axis.

It only cares about this output levels as they influence the revenues and the profits of the company.

So we would say that the company really worries about the value of the marginal product of each input, also called the marginal revenue product, which is simply the marginal product of an input times price of the output good.

So we should think that marginal product gives the quantity of output good produced by the marginal worker or marginal hour worked and so this is the quantity of the product produced and we multiply it by the price in the final goods market to obtain the extra revenue that company gets from hiring one unit of labor.


We should think that this value of the marginal product of labor determines how much of labor the company will want to hire.

And we should think that because of diminishing marginal productivity of labor as the company hires more and more labor the value of the marginal product falls and we would observe this downward sloping demand curve of the company for labor.

On the next two slides we will also discuss the supply of labor and we will say that the supply of labor measures the disutility of workers from providing their work to companies.

And we will say that if the disutility that workers get from working is increasing in the amount of work.

Here you should think that that's intuitive.

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To work one hour does not cost worker as much disutility as working the fortieth hour or the fiftieth hour in a week.

So as the worker works more and more hours the marginal disutility of working increases and presumably the worker would demand greater wages to compensate him or her for that marginal disutility.

Okay, so but on one more slide let's discuss the determinants of the value of the

marginal product which is the demand curve of the company for labor and then we will turn to discussing the supply curve.

So, so far we've said that the demand curve for labor is downward sloping and we might wonder how does this demand curve change over time.

We should think that well that this demand curve depends on the price of the final good that the company produces, right?

We've said that the demand curve is a simple product of marginal product times price of the final good and so if price of the final good or if the marginal product changes that will result in the shift of the entire demand curve of the company for labor, right?

And so we can think that the marginal productivity of input changes with technological change and with the availability of other inputs in the production process.

We've talked about this issue previously, we've said that between different factors of production in labor, capital, land there might be a complimentary relationship where if a company purchases more computers or more tractors or more other kind of capital each unit of labor could become more productive.

Intuitively, if a company has a fixed number of workers and it hire, it buys more computers plausibly each of the workers could becomes more productive because they can work with more other resources.

Talking about the supply of labor, I've said that the supply curve measures the disutility that workers receive from providing their work to a company.

And here if you think back to the market supply and demand model that we've discussed before.

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We were saying that the market supply curve measures all the implicit and explicit costs of providing particular good or service, in this case we are talking about the market for labor and providers of labor are individual workers and you should think that there are no explicit costs of providing labor.

Workers don't have to outlay, don't have to expand any resources to provide their services.

So, there are only implicit costs of providing labor, the disutility the labor causes to workers. Okay?

And, the upward-sloping labor supply curve implies that as workers work more hours, they demand, they experience greater marginal disutility of working and they might



require greater compensation for that, for their labor.

What would cause the labor supply curve to shift?

Now, think, let's think back again to chapter 4 where we discussed the supply and demand model, and here you should think the situation between demand and supply sides of the market is, is inverted.

We used to have big companies providing a product to individual households, individual consumers.

In this case, we have individual workers providing their services to corporations.

And so, intuitively you should think that the factors that determine the demand curve in a final goods market, are similar to the factors that determine the supply curve for labor.

And similarly, the factors that used to determine the supply curve in the final goods market, we could say that those factors influence demand for labor and in this input market.

So we would say that individual workers' tastes, expectations about future state of the economy, expectations about future hours worked determine how many hours, for a given wage rate, a worker will be willing to work.

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Changes in alternative opportunities, so here if we discussed the labor market in different industries, let's say the labor market in manufacturing, labor market in services, you should think that the equilibrium in the labor market in manufacturing depends on the conditions in the labor market in services or in other parts of the economy.

Legislation influences how many hours workers can legally supply.

Immigration determines how many workers there are in the economy. Once again, we are adding up the supply curves of individual workers to obtain the market-wide labor supply.

And, so the number of workers available influences that directly.

Finally, I've talked about the disutility of working, so you may think that as economy develops, maybe as jobs become easier, less manual, the labor supply curve could shift to the right.

And some empirical considerations, so in this basic model, we've said that companies compare the marginal cost of hiring workers, which is the wage rate, to the marginal benefit of hiring workers, which is the value of the marginal product, which means the monetary measure of productivity of workers.



And, in the real world, when we compare wage rates and changes, or growth rates in wage rates and productivity, we would observe the same pattern.

So, the real world supports this idea that companies equate wages to the monetary measures of workers' productivity.

For Korea, we can find that overall productivity has been increasing at the rate of 5 to 6 percent annually.

But this growth in productivity is very different in individual sectors in the economy.

In manufacturing, we see 8 to 9 percent average growth rate whereas in services, such as in office work, in restaurants, in hotels, the productivity increases at a much slower rate at about 3 percent annually.

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So that thinking about this table, we would predict that wages in manufacturing will be greater and will be going up at a greater rate than wages in services.

And in fact, when we, when we look at the graph of productivity in manufacturing, in services and in the overall economy, we observe that productivity of manufacturing increases at a much faster rate, on average manufacturing workers produced almost 70 thousand won worth of output whereas in the service sector, on average, workers produced about 20 thousand won worth of output per hour.

And now, so this is what the theory tells us.

And now, you might wonder how, so the theory also predict that since the value of the marginal product is roughly 20 thousand won in services that would imply that wages in services will be about 20 thousand won.

And, in manufacturing, we might expect wages to be around 70 thousand won per hour.

And you may think that these are pretty high numbers. And, in reality the real wage rates might be lower.

Why could there be differences between wage rates and marginal productivity in the real world?

For one, remember that there are different assumptions that we've imposed on this model.

We've assumed that there's perfect competition in the final good market.

There's perfect competition in the labor market.



Wages get set exactly at where the company's value of the marginal product is equal to worker's disutility, marginal disutility from providing the work.

We've assumed that there's perfect information so that workers and companies get matched easily.

And the prices get adjusted exactly to the correct level.

If some of these assumptions are not satisfied, we might not get the property that wages would be equal to the value of the marginal product and in the equilibrium.

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As a small digression, since we've talked about imperfect competition in the previous chapters, here's another example of a market situation with a monopoly power.

Suppose that the company has a monopoly power over workers.

So here, imagine that there is a small town where there are many potential workers but only one company that could hire these workers.

And when the company's thinking how many workers to hire, where exactly on the horizontal axis to be, the company is evaluating how much extra benefit it will get, how much extra revenue it will get from hiring a worker with the extra expenditure or the extra cost of hiring an additional worker.

When the company hires an additional worker, it recognizes two effects.

One, marginal worker demands greater compensation than all the previous workers, simply from this upward sloping supply curve.

So when the company hires an additional worker, it has to offer this additional worker greater wage rate than the wages to previous workers.

In addition, because the company cannot offer different wages to different workers, when the company hires this additional worker, it has to pay higher wages to all existing workers.

Remember when we discussed monopoly, we said that there's an output effect versus a price effect of changing the company's quantity.

Here I want you to think that the price effect and the output effect work in the same direction.

When the company hires an additional worker there is the output effect.

We have to pay the additional worker a certain wage rate.



In addition, there is a price effect because we have to increase the wages to all existing workers.

As a result, the extra expenditures by the company are not just the amount on the supply curve but the extra expenditures are greater than the actual wage offered to the marginal worker.

So we can distinguish the supply curve in the market from the marginal expenditure curve made by the company.

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This marginal expenditure curve is equivalent to the marginal revenue curve that we discussed for monopoly in the final goods market.

And you can think that in the equilibrium, the company will equate the marginal expenditures on labor with the marginal benefit or the value of the marginal product.

And the company will stop hiring workers when the marginal expenditures are just equal to the marginal benefits of hiring labor.

And so at the equilibrium, the monopsonist will hire this many workers, marginal worker will have this value of the marginal product, but the wage rate offered will be at this level.

So there's this gap between the value of the marginal product and the wage rate of the marginal worker.

So you can see that if markets are not perfectly competitive, if the labor market is not perfectly competitive, we could have a gap between the value of the marginal product and the wage rate.

And the final thought is that of course labor is not the only input used in the production process and the company also has to hire various kinds of capital, land maybe various kinds of labor in order to produce final goods.

And you should think that the decision to hire each of those individual inputs depends on how much of all the other inputs the company has.

So generally the decision to hire labor by capital or rent land are interrelated.

You should think that, one way to think about this issue is that the company decides how much labor to hire than the company checks whether with this amount of labor the company has sufficient amount of capital and land maybe the company would adjust its amount of land and capital and then the company would check again whether with this greater amount of capital and land whether it still has the profit maximizing amount of labor.

And maybe it would readjust the amount of labor used.

So iteratively, you may think that the company readjust its amount of labor capital and land, so that at the equilibrium, all of these inputs are used where their rental rate or wage rate is equal to their individual value of the marginal product.

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