

Chapter 12 outline

The shift from consumers to producers

Resource markets are markets in which business firms demand factors of production from household suppliers. (As you can see the tables are now turned – the producer is demanding and the consumer is supplying).

Flow chart

Take a look at the flow chart on page 312 of your book (1st page of Ch12). The outside circle represents the flow of money from businesses to households and then back to businesses. (Don't get caught up in where the money came from – it's analogous to which came first, the chicken or the egg?) Suppose the money starts with the businesses. The businesses want to produce so they hire labor and pay the households for their service. The households now have money with which to purchase goods from the businesses, including the company they work for. The households spend this money on goods and services, the businesses take their money and pay more labor for more production and the cycle continues.

Now for the inner circle. The households hold the factors of production. When approached by the businesses for their services, the households and businesses come to an agreement on how much money the businesses are to pay them. The households then “rent” their factors of production to the businesses. The factors of production then turn out goods and services that the households consume. The cycle then begins again.

Although this is a simplistic model of the way the world works, it is fairly accurate. After all, what do people do every day? They get up, go to work, get paid for working, go home and spend their money. What do businesses do? They hire labor, produce, sell their product, extract any excess profits for themselves, and then use the rest of the money to hire more labor.

Human vs. non-human resources

This is a simple distinction. Non-human resources include, but are not limited to: land, money, buildings, machinery, etc. Human resources include all those skills that are provided by the human machine, including but not limited to: physical labor, intellectual labor, etc.

Human capital is defined as the expenditures made to develop the human machine. Thus, your attending the economics class is an attempt to increase your human capital.

Demand for resources

The demand for resources is a derived demand, whereas the demand for goods and services (by consumers) is simply based on their “needs and wants”. Derived demand means that you base your demand for the resource on the demand for the final good or service. To contrast this with “regular” consumer demand, suppose consumers demand that all Coca-Cola be packaged in 80 ft. bottles. Producers (although probably very confused) would shift their demand for resources away from 12 oz. cans and 20 oz. bottles and 2 liters to 80 ft. bottles of Coke. The labor used to make the previous products would be used to make 80 ft. bottles of Coke and the materials used would shift from a combination of plastic and aluminum to all plastic. Thus the demand for labor and plastic by the producer (Coca-Cola in this case) is derived from the consumer demand for 80 ft. bottles of Coke.

Now suppose that the Coca-Cola producers just decided to produce 80 ft. bottles of Coke without any consideration of consumer demand. The resource market would shift, but after one shipment of the 80 ft. bottles, the demand for them just wouldn't quite be there. So, Coca-Cola would shift back towards the more “practical” methods of selling its products, and once again consumers would determine where resources are best spent rather than a producer acting on a whim determining where resources are spent. Or rather, “If you build it, they will come...but only if they really demand your product”. And that is where the key to production lies – knowing what products your consumers demand.

Substitution in production – the same concept as substitution in consumption.

If the price of a resource increases, firms will substitute away from that resource to a more cost-efficient resource, much like consumers will shift away from a high priced good to a lower cost substitute.

Shifts in the demand for resources

What factors cause shifts in the demand for resources?

1. A change in the demand for a product will cause a similar change in the demand for resources needed to make that product.
2. Changes in the productivity of a resource will alter demand – the more productive the resource is, the more businesses will demand it.
3. A change in the price of a related resource will affect the demand for the original resource.
 - a. resource substitutes – an increase in the price of a substitute will increase the demand for the given resource
 - b. resource complements – an increase in the price of a complement will decrease the demand for the given resource

Marginal productivity and the firm's hiring decision

How do producers decide how much of a resource to use?

What is the marginal benefit to the producer of using more unit of resource? It is the marginal revenue product of that resource. Marginal revenue product is defined as the increase in total revenue resulting from a one unit increase in the amount of resources employed.

The book's example is fine. If we hire a security guard for \$25/hr. to stop shoplifting and we are only losing \$20/hr. to shoplifters, it costs us more to hire the guard to stop shoplifters than it does to lose the merchandise to the shoplifters. Therefore, hiring the guard is not efficient because his marginal cost exceeds his marginal benefit.

Employment of a variable resource with a fixed resource

Say we have a fixed resource: amount of land. We have 20 workers now. What effect will the 21st worker have on our firm? Initially, we get one more workday from that 21st worker. The change in the total output that results from the employment of that 21st worker is called the marginal product of that worker. This idea can be expanded to include adding one more unit of any resource to the land, with the marginal product of that resource being the change in total output that results from its (the resource's) employment.

The next step the firm takes is to sell its output. Recall that marginal revenue is the increase in total revenue that results from an additional unit of

the product being sold. We can then find the resource's **marginal revenue product** (note that this is **not** the same as marginal product or marginal revenue of that resource) by multiplying the resource's marginal product times its marginal revenue. Mathematically,
 $MRP = MP \times MR.$

One other term to note is value of marginal product (don't blame me for the terms being so similar – I didn't make them up). Value of marginal product is equal to the marginal product of a resource times the price of the product it helps to produce. Mathematically,
 $VMP = MP \times P.$

How does the MRP become the firm's demand curve for a resource?

At one unit of resource employed, the MRP of that unit is \$1000. At the second unit of resource employed, the MRP of that unit is \$800. At the third unit of resource employed, the MRP of that unit is \$600. At four units, the MRP of the fourth unit is \$400, at five units the MRP is \$300, at six units the MRP is \$200, and at seven units the MRP is \$100. We can now see that an inverse relationship is formed between the number of units of the resource employed and the MRP of those resources. Recall that a profit maximizing firm will only use those resources where marginal revenue product exceeds the marginal cost of the resource (the shoplifting example).

How does the MRP (firm's resource demand) curve shift?

1. if the price of the product (final good or service) increases, the MRP curve will increase
2. if the productivity of the resource increases, the MRP curve will increase
3. if the amount of the fixed resources increases, the MRP curve will increase

Employment with many variable resources

Profit max. with multiple various resources – by assumption, that resources are perfectly divisible (we can have 1 ½ humans and 1 ¾ machines) then the price of a resource will equal its MRP.

Cost min. with multiple resources – when a firm maximizes profits, it also minimizes costs (after all, if 8 is the profit maximizing quantity, you would

want to produce 8 at the lowest cost wouldn't you?) To minimize costs consider the following example. We have skilled labor, unskilled labor, and machine labor. We have one more dollar to spend on total labor (let's assume that we spend it all on either skilled, unskilled, or machine –we don't spend 50 cents on machine and 50 cents on unskilled or any other combinations). If we spend that dollar on unskilled labor we get 4 more units of output. If we spend that dollar on skilled labor we get 6 more units of output. If we spend that dollar on machine labor we get 2 more units of output. Where will we spend that dollar?

Answer: skilled labor, because we get more units of output from it for that dollar than from any other input. Because we get more from the skilled labor input, we substitute away from the other inputs until this equation is satisfied:

$$\frac{\text{MP skilled labor}}{\text{Price skilled labor}} = \frac{\text{MP unskilled labor}}{\text{Price unskilled labor}} = \frac{\text{MP machine labor}}{\text{Price machine labor}}$$

This equation reflects the fact that a business is minimizing its per-unit cost of production. Look at it this way. If the MP of a college grad is twice the marginal product of a high school grad, we would expect that the college grad be paid twice as much as the high school grad. From our formula, if MP of college grad = 10 = 2 times the MP of high school grad (the MP of the high school grad is 5) and the college grad is paid \$20/hr. the high school grad should get \$10/hr. since $10/\$20 = 5/\10 .

Consider the same MP's for the college grad and high school grad (10 and 5 respectively). If the college grad is getting paid \$15/hr. and the high school grad is getting paid \$10/hr. who would the firm rather hire? The college grad because $10/\$15 > 5/\10 . The firm would get more for their money by hiring the college grad. This is also why it is not always necessary to relate low wages with low cost. If someone is making minimum wage (\$5.15/hr.) and another person is making \$10/hr. the minimum wage person is obviously the better hire because he is cheaper right? Not necessarily. If the \$10/hr. person is 3 times as productive, an intelligent employer would hire that person.

The central proposition of the marginal productivity theory of employment It states that: firms minimize their per-unit costs of production when they hire additional units of each resource as long as the units' marginal

productivity generates revenues in excess of costs. Firms will not pay more for any form of labor than it is worth to them.

Once again, this is nice theory, but it is sometimes difficult to recognize the marginal benefits and costs of that one additional unit of labor.

Supply of resources

Resource owners (households) will supply their resources to the employer who offers them the best alternative. Notice that this is not necessarily the highest paying alternative. Suppose you were offered two identical jobs, with only two differences:

Job 1: \$50,000/yr., live in Alaska

Job 2: \$45,000/yr., live in Hawaii

(also assume that the cost of living in Alaska and Hawaii is the same as I really don't know what the relative costs of living are)

Is it worth \$5000/yr. extra to live in Alaska over Hawaii? Not to a South Florida boy who grew up on the beach. I would take \$45,000 in Hawaii over \$50,000 in Alaska any day of the week. However, the value of living in a certain state is subjective, which leads to differences in valuations of those states across people.

Short-run vs. long-run supply

Obviously, a direct relationship applies when looking at supply. As the price paid for a resource rises, people are more willing to supply it. Because lawyers make a lot of money, more people want to become lawyers, even if they are not very good at it. Also, as computer programming and networking becomes more important to us, the prices paid to fill those jobs rises. So more people attempt to become computer programmers in the short run. Notice the word attempt. In the short run people want to participate in a profession to reap the benefits of increases in that profession. However, it takes time to become a lawyer or a computer programmer. So there still may be a shortage of those professions in the short run, but in the long run there may be a surplus of those professions. It all depends on how much people are willing to invest in the supply of resources and how much time it takes to make that investment. After all, if it only took 6 months to become a lawyer, the long run supply curve would be more elastic than if it takes 7 years because less resources (time included) would be used to produce

lawyers, so we could produce lawyers more readily with a shorter training time.

Supply, demand, and resource prices

We have seen that supply and demand together form the equilibrium price and quantity of goods. Should we expect the equilibrium prices and quantities of resources to be formed differently? Of course not.