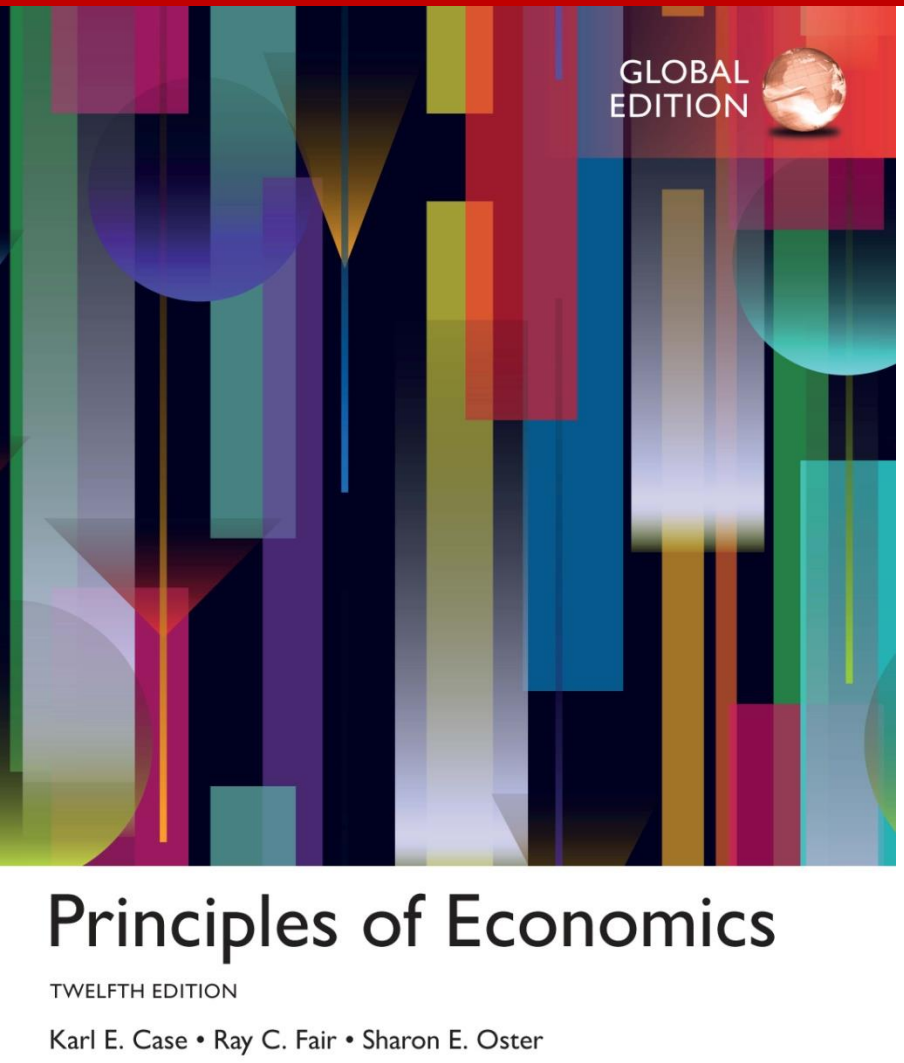
Principles of Economics

Twelfth Edition



Chapter 10

Input Demand: The Labor and Land Markets

Chapter Outline and Learning Objectives
(1 of 2)

10.1 Input Markets: Basic Concepts

- Define the basic concepts of input markets.

10.2 Labor Markets

- Discuss the conditions that affect supply and demand in labor markets.

10.3 Land Markets

- Describe the relationship between supply and demand in land markets.

Chapter Outline and Learning Objectives
(2 of 2)

10.4 Demand Curves

- Identify factors that trigger shifts in factor demand curves.

10.5 The Firm's Profit-Maximizing Condition in Input Markets

- Understand how the prices of the different inputs relate to their relative productivity.

Looking Ahead

Chapter 10 Input Demand: The Labor and Land Markets

- We will find out what determines the prices in the markets for inputs.
- This chapter sets out a framework for labor and land.
- Chapter 11 will tackle the more complicated topic of capital and investment.

Input Markets: Basic Concepts *(1 of 2)*

Demand for Inputs: A *Derived* Demand

- **derived demand** The demand for resources (inputs) that is dependent on the demand for the outputs those resources can be used to produce.
- Inputs are demanded by a firm if and only if households demand the good or service provided by that firm.
- **productivity of an input** The amount of output produced per unit of that input.

Input Markets: Basic Concepts *(2 of 2)*

Marginal Revenue Product

- **marginal product of labor (MP_L)** The additional output produced by 1 additional unit of labor.
- **marginal revenue product (*MRP*)** or **value of marginal product (VMP)** The additional revenue a firm earns by employing 1 additional unit of input, *ceteris paribus*.

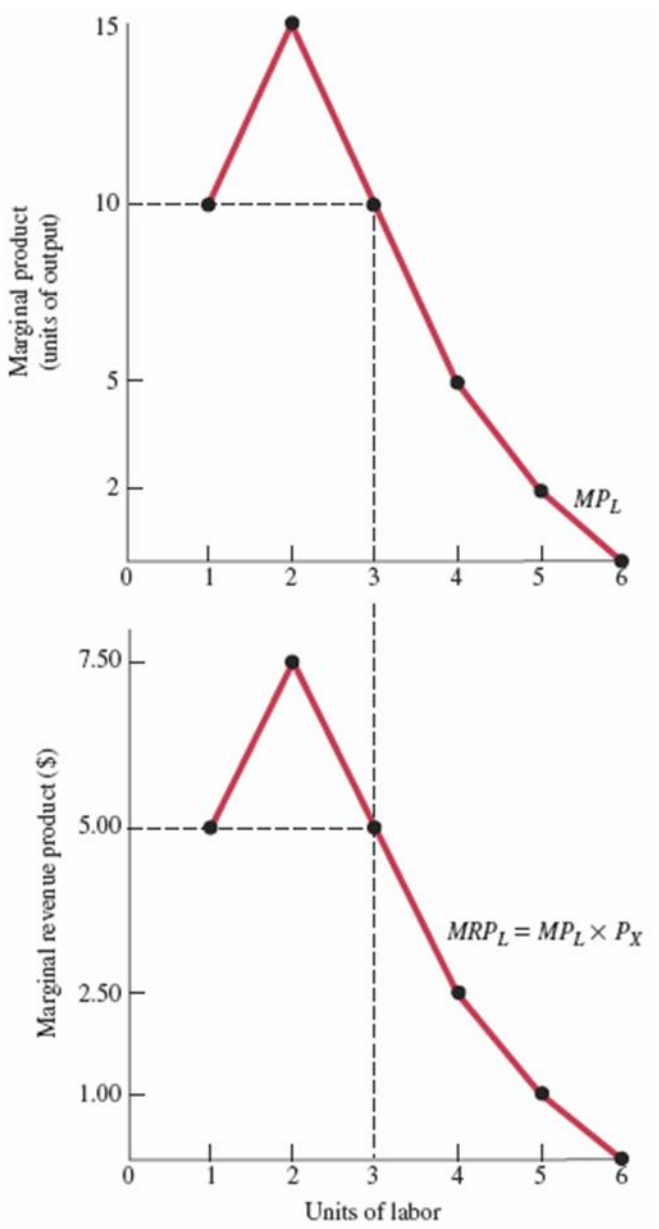
$$MRP_L = MP_L \times P_x$$

TABLE 10.1 Marginal Revenue Product per Hour of Labor in Sandwich Production (One Grill)

(1) Total Labor Units (Employees)	(2) Total Product (Sandwiches per Hour)	(3) Marginal Product of Labor (MPL) (Sandwiches per Hour)	(4) Price (PX) (Value Added per Sandwich)[a]	(5) Marginal Revenue Product (*MPL* × *PX*) (per Hour)
0	0	—	—	—
1	10	10	$ 0.50	$ 5.00
2	25	15	0.50	7.50
3	35	10	0.50	5.00
4	40	5	0.50	2.50
5	42	2	0.50	1.00
6	42	0	0.50	0.00

[a] The “price” is essentially profit per sandwich; see discussion in text.

FIGURE 10.1 Deriving a Marginal Revenue Product Curve from Marginal Product



The marginal revenue product of labor is the price of output, P_X, times the marginal product of labor, MP_L.

ECONOMICS IN PRACTICE

Do Managers Matter?

Managers can affect the productivity of the people who work for them.

In a field experiment, researchers randomly divided Indian textile firms into two groups. In the treatment group, firm managers were taught a range of operational practices that might be effective. A second group, a control group, received no training.

The results? Within the first year after treatment, productivity in the treated firms increased by 17%.

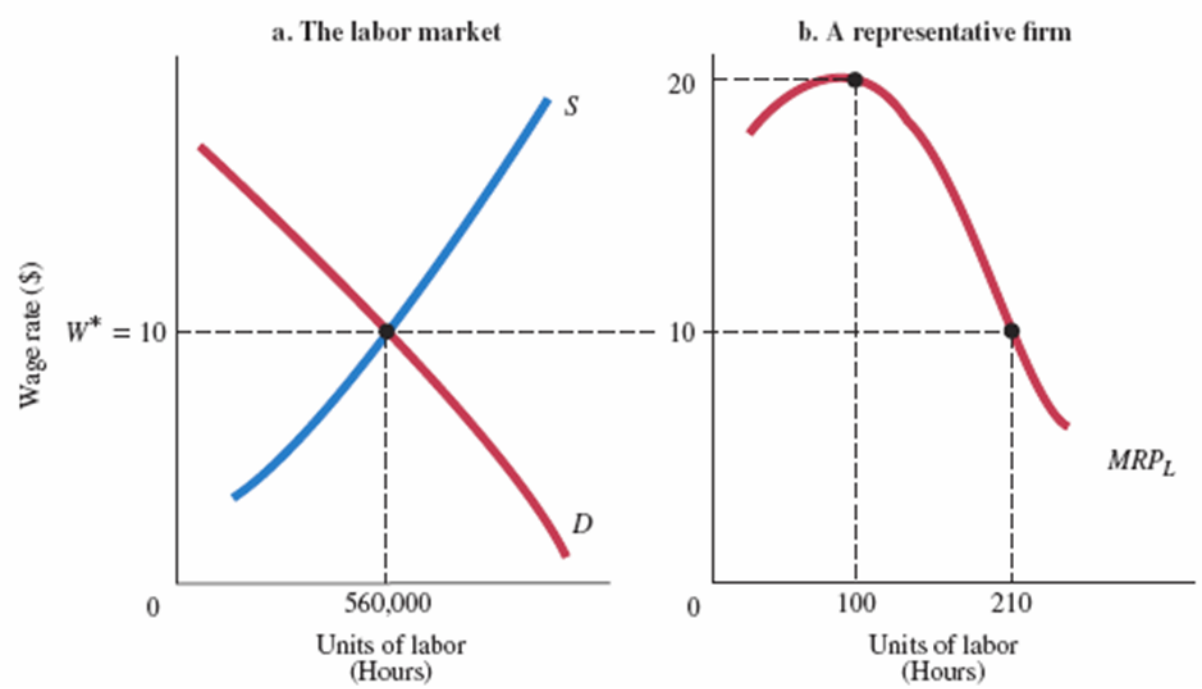
THINKING PRACTICALLY

1. Many of the firms treated had multiple plants. After the researchers left, what do you think they did about training in their other plants?

Labor Supply

- The labor supply curve traces the relationship between wage rates and the number of hours workers are willing to supply, holding other things constant.
- **market labor supply curve** The horizontal aggregation of the individual labor supply curves for workers in an area.

FIGURE 10.2 Marginal Revenue Product and Factor Demand for a Firm Using One Variable Input (Labor)



A competitive firm using only one variable factor of production will use that factor as long as its marginal revenue product exceeds its unit cost.

A perfectly competitive firm will hire labor as long as MRP_L is greater than the going wage, W^*. The hypothetical firm will demand 210 units of labor.

The Firm's Labor Market Decision

Comparing Marginal Revenue and Marginal Cost to Maximize Profits

- In Chapter 8, a firm compares the marginal revenues and costs of producing one more unit of *output*.
- Here the firm compares the marginal revenues and costs of employing another unit of *input*.
- In both cases, the firm is comparing the cost of production with potential revenues from the sale of product *at the margin*.

ECONOMICS IN PRACTICE

The National Basketball Association Contracts and Marginal Products

According to a study, productivity significantly determines the NBA player salaries, with points per game and field goals percentage as the two main contributors.

However, it has been indicated that teams unable to distinguish between ability and effort, may "overpay" its productive players, whose performance may decline in the year following the new contract, unless there exists confounding effects acting in the opposite direction.

THINKING PRACTICALLY

1. What would you suggest for teams to successfully evaluate and identify players with natural ability and have the most potential for continued improvement?

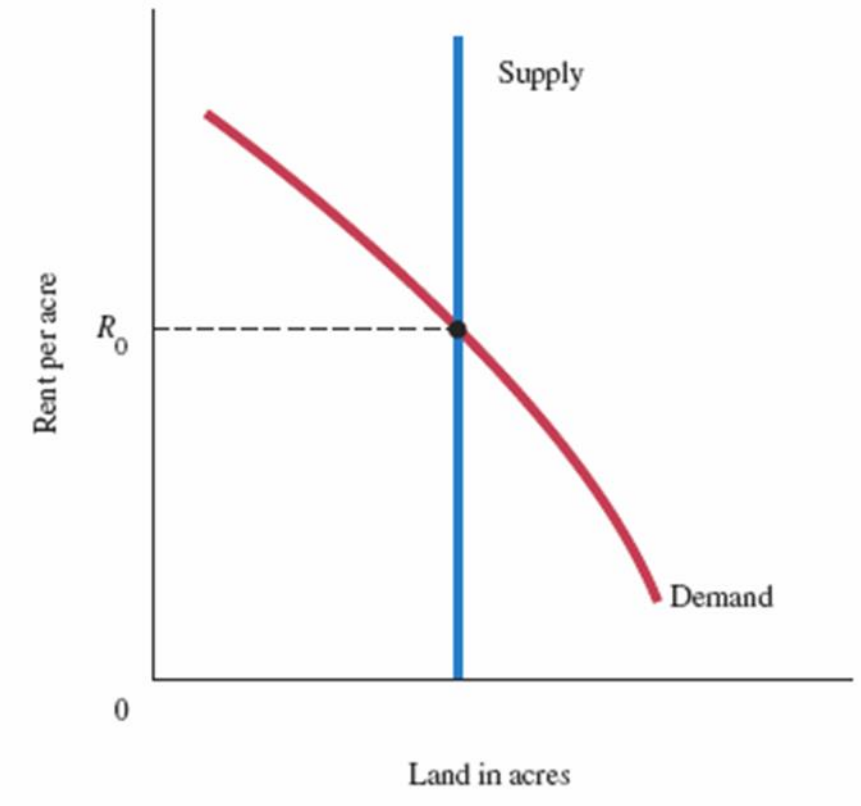
Many Labor Markets

- Each market has a set of skills associated with it and a supply of people with the requisite skills.
- If labor markets are competitive, the wages in those markets are determined by the interaction of supply and demand.
- As we have seen, firms will hire workers only as long as the value of their product exceeds the relevant market wage.
- This is true in all competitive labor markets.

Land Markets

- **demand-determined price** The price of a good that is in fixed supply; it is determined exclusively by what households and firms are willing to pay for the good.
- **pure rent** The return to any factor of production that is in fixed supply.

FIGURE 10.3 The Rent on Land Is Demand Determined



Because land in general (and each parcel in particular) is in fixed supply, its price is demand determined.

Graphically, a fixed supply is represented by a vertical, perfectly inelastic supply curve. Rent, R_0, depends exclusively on demand—what people are willing to pay.

Rent and the Value of Output Produced on Land *(1 of 2)*

- A firm will pay for and use land as long as the revenue earned from selling the product produced on that land is sufficient to cover the price of the land.
- Stated in equation form, the firm will use land up to the point at which $MRP_A = P_A$, where A is land (acres).
- The allocation of a given plot of land among competing uses thus depends on the trade-off between competing products that can be produced there.

Rent and the Value of Output Produced on Land *(2 of 2)*

- One final word: Because land cannot be moved physically, the value of any one parcel depends to a large extent on the uses to which adjoining parcels are put.

ECONOMICS IN PRACTICE

Land Valuation

In cities like Tokyo, Bangkok, and Mumbai, an initial capital of $300,000 buys only a small piece of land. In Hokkaido, Koh Phangan, and Tamil Nadu, you would fare better. In some parts of these countries, larger plots of (or several pieces of) land will be available for $300,000.

The price and value differences are due to political, social, and legal restrictions on land ownership and use, comparable across each country.

People will pay more for a land that is likely to achieve a higher resale value.

THINKING PRACTICALLY

1. Farmland prices across some regions are skyrocketing, though the commodities associated with the land are experiencing a significant decline in prices. Why is this so?

Input Demand Curves

Shifts in Factor Demand Curves

The Demand for Outputs

- In case of labor (L): $MRP_L = MP_L \times P_x$
- If product demand increases, product price will rise and marginal revenue product (factor demand) will increase; the *MRP* curve will shift to the right.
- If product demand declines, product price will fall and marginal revenue product (factor demand) will decrease; the *MRP* curve will shift to the left.

Shifts in Factor Demand Curves *(1 of 2)*

The Quantity of Complementary and Substitutable Inputs

- The production and use of capital enhances the productivity of labor and normally increases the demand for labor and drives up wages.

The Prices of Other Inputs

- When a firm has a choice among alternative technologies, the choice it makes depends to some extent on relative input prices.

Shifts in Factor Demand Curves *(2 of 2)*

Technological Change

- **technological change** The introduction of new methods of production or new products intended to increase the productivity of existing inputs or to raise marginal products.

Profit-Maximizing Condition in Input Markets *(1 of 2)*

- The profit-maximizing condition for the perfectly competitive firm is:

$$P_L = MRP_L = (MP_L \times P_X)$$

$$P_K = MRP_K = (MP_K \times P_X)$$

$$P_A = MRP_A = (MP_A \times P_X)$$

where L is labor, K is capital, A is land (acres), X is output, and P_X is the price of that output.

Profit-Maximizing Condition in Input Markets *(2 of 2)*

- If all the conditions hold at the same time, it is possible to rewrite them another way:

$$\frac{MP_L}{P_L} = \frac{MP_K}{P_K} = \frac{MP_A}{P_A}$$

REVIEW TERMS AND CONCEPTS

- demand-determined price
- derived demand
- marginal product of labor (MPL)
- marginal revenue product (MRP)
- market labor supply curve
- productivity of an input
- pure rent
- technological change

Equation:

- $MRP_L = MP_L \times P_x$