Factor markets

A Glimpse of the Theory Ahead

When market forces allocate resources among various products, they also determine factor incomes.

Equilibrium prices and quantities in factor markets determine factor incomes.

Factor demand: firms' profit-maximizing decisions?

Factor supply: alternatives for factors of production?

The Demand for Factors

The demand for any input is a derived demand.

For example, since automobile construction uses steel extensively, we say that the demand for steel is partly derived from the demand for automobiles.

Derived demand links goods markets to factor markets.

The Firm's Marginal Decision on Factor Use

Marginal revenue product (MRP) is the increase in revenue after adding one unit of a factor.

The factor's MRP has a physical component (***MP***) and a dollar component (***MR***).

$$MRP = MP \times MR$$

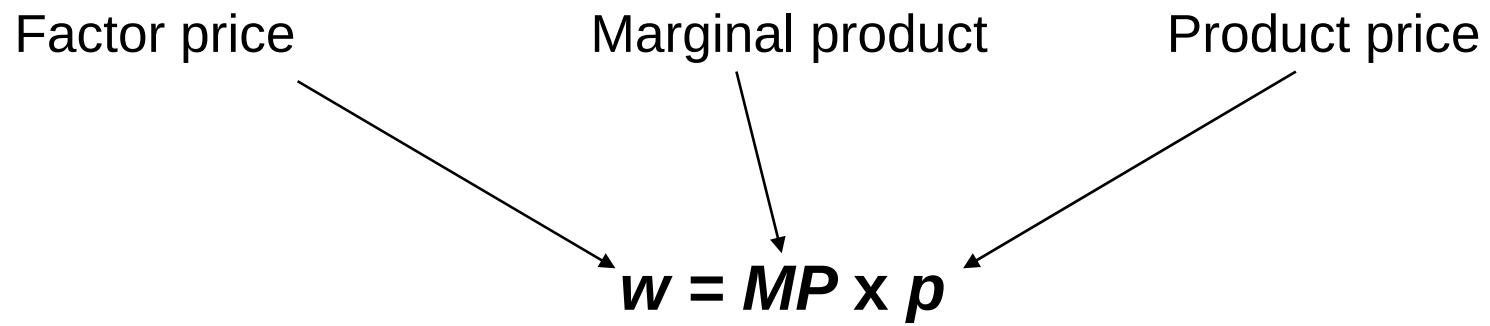
Given the factor's market price and its ***MRP***, how many units of the factor should the firm use?

Marginal Revenue Product

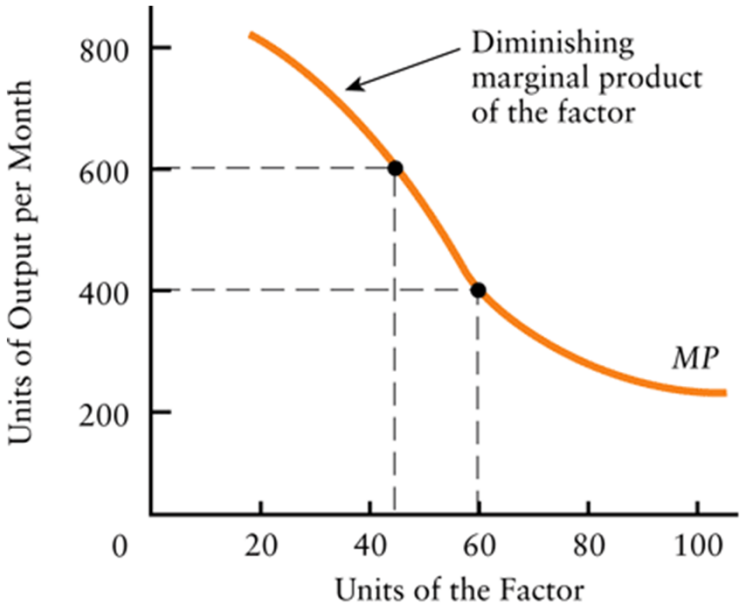
A profit-maximizing firm will hire until the factor's ***MC*** equals its ***MRP***:

Marginal cost of the factor = **Marginal revenue product of the factor**

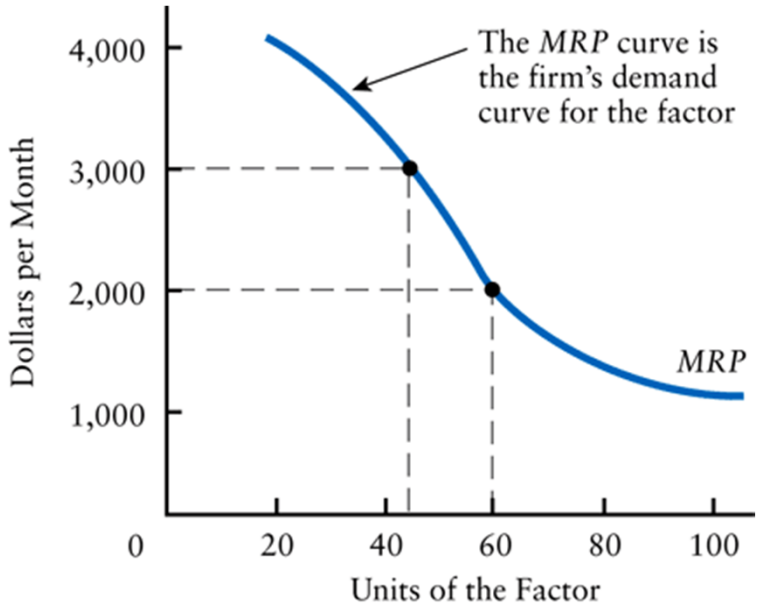
If the firm is a price taker in both factor and product markets, we can simplify this condition to:



From Marginal Product to Demand Curve



(i) The *MP* curve



(ii) The *MRP* curve (the demand curve)

Elasticity of Factor Demand

What determines the elasticity of factor demand?

1. If the ***MP*** of a factor declines rapidly as more of a factor is employed, then factor demand will be relatively inelastic.

2. The easier it is to substitute away from a factor, the more elastic the demand for that factor.

3. The more important a factor is in producing some good (as a share of total costs), the more elastic the demand for that factor.

4. The more elastic the demand is for the firm's product, the more elastic will be the firm's demand for the factors used to make that product.

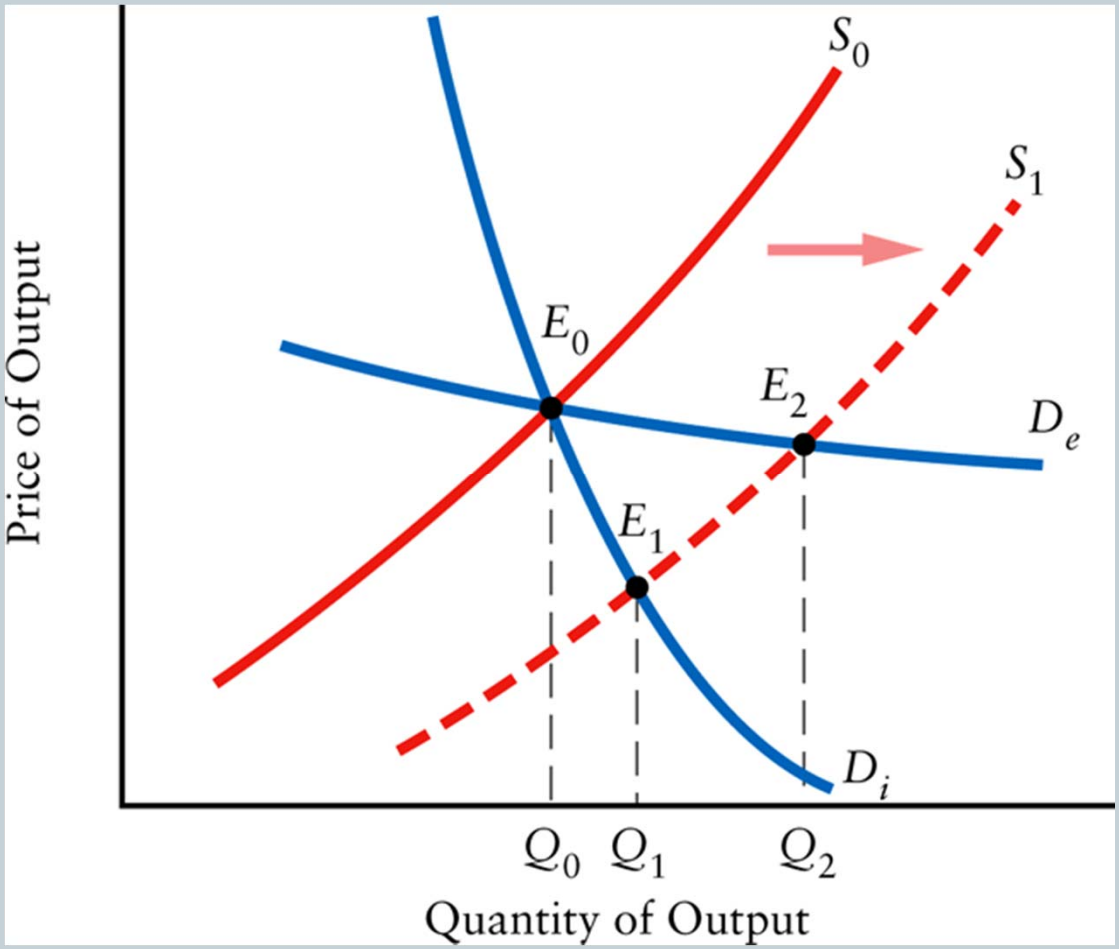
The Market Demand Curve for a Factor

The market demand curve for any factor of production is less elastic than a simple horizontal summation of all the individual firms' demand curves.

Any one firm's production will have no significant effect on the equilibrium market price, so the additional use of a factor will have no effect on that price.

But all the firms taken together *do* have an effect on the equilibrium price.

More Elastic Product Demand Leads to More Elastic Factor Demand



Shifts of the Market Factor Demand Curve

Demand for a factor increases when the factor's ***MRP*** increases:

- changes in the factor's ***MP***

- changes in the price of the product

The Supply of Factors

We consider supply at three different levels of aggregation:

- the amount supplied to the economy as a whole
- the amount supplied to a particular industry or occupation
- the amount supplied to a particular firm

The elasticity of factor supply will be different at each level of aggregation due to factor mobility.

The Supply of Factors to the Economy

The total supply of each factor is given at any point in time.

These supplies respond to both economic and non-economic forces.

Physical Capital

The supply of capital in a country consists of the stock of existing machines, plants, and equipment.

The total supply of physical capital changes slowly over time — through net investment.

Land

The total area of dry land in a country is almost perfectly fixed.

But the supply of fertile land changes as more land is cleared and improved for agricultural or other purposes.

Labor

The number of people willing to work is called the labor force.

The total number of hours they are willing to work is called the supply of labor.

The supply of labor depends on:

1. the size of the population
2. the proportion of the population willing to work
3. the number of hours each individual wants to work

The population varies over time due to births, deaths, and net immigration (which tends to increase in good economic times).

The proportion of the total population that is willing to work is called the labour-force participation rate.

The Supply of Factors to a Particular Industry

A factor's elasticity of supply to a particular use is larger than its elasticity of supply to the entire economy.

Factor mobility is the ease with which factors can be transferred between uses.

Capital Mobility

Some kinds of capital equipment can be switched easily among uses; many others are less easily switched.

But in the long run, most capital is highly mobile.

Land Mobility

Although land is highly mobile among alternative uses, it is completely immobile as far as location is concerned.

Labor Mobility

Non-monetary considerations are much more important for the supply of labor than for other factors of production (e.g., working conditions).
Some individuals with very specific skills find it difficult to switch jobs over short periods of time.
Over longer periods, however, the labor force as a whole is very mobile.

Most firms can obtain factors at the going market price.

Therefore, individual firms usually face perfectly elastic supply curves for factors, even though the supply for the economy as a whole may be quite inelastic.

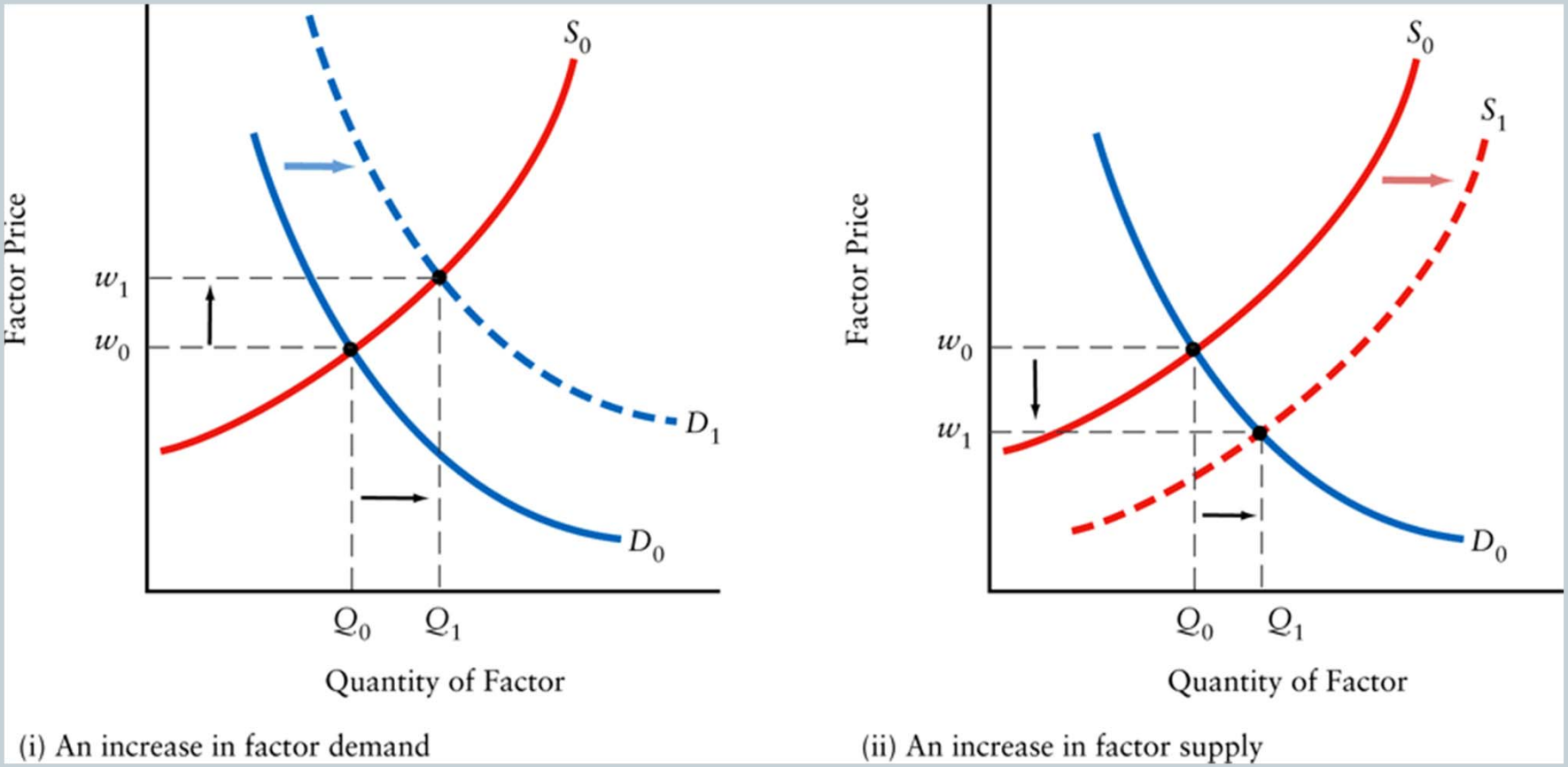
The Operation of Factor Markets

Demand and supply jointly determine the factor's price and quantity.

The factor's income equals price times quantity.

Changes in factor markets can occur either because of a change in demand for the factor or because of a change in the supply of the factor, or both.

Demand and Supply Shifts in a Competitive Factor Market



Differentials in Factor Prices

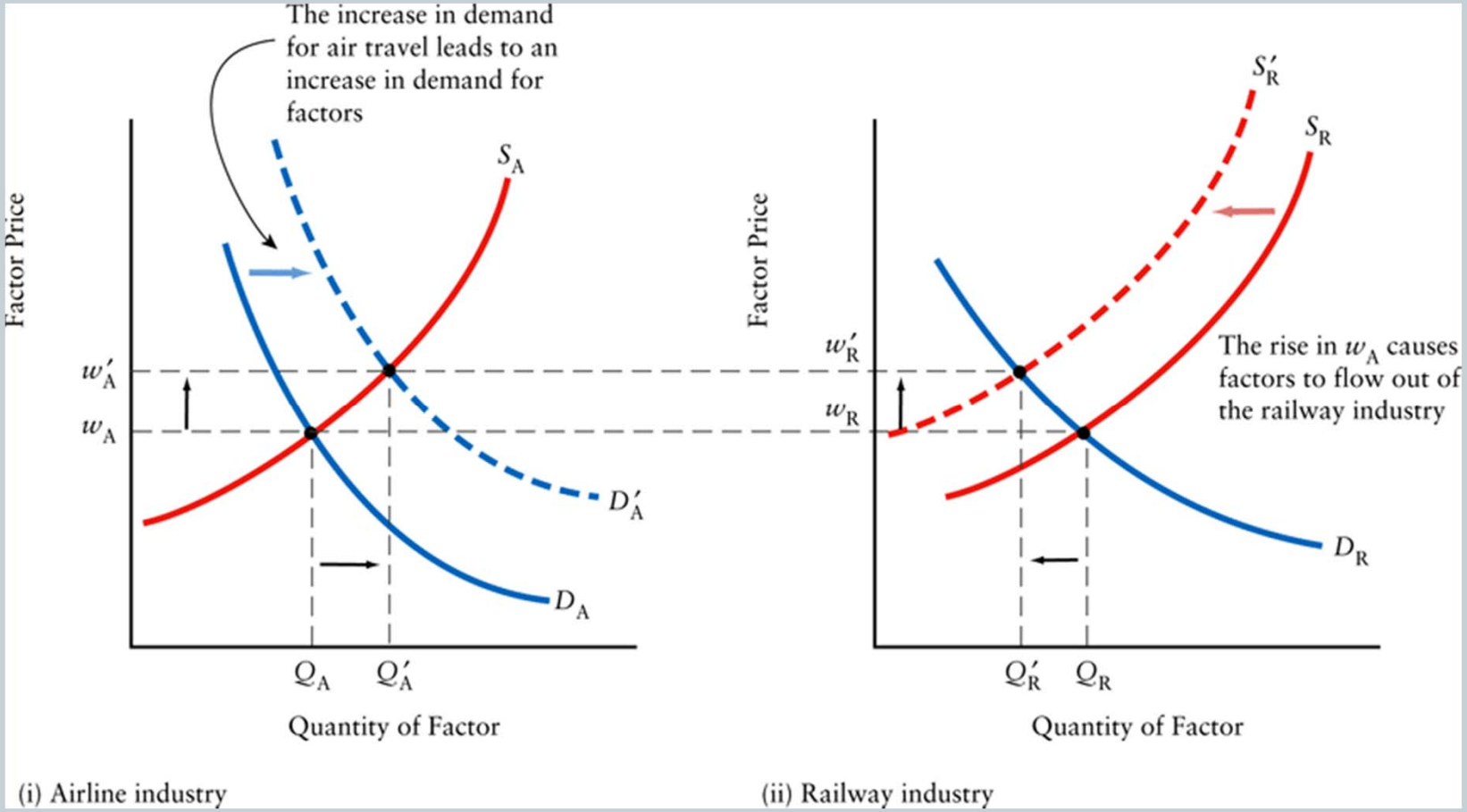
Factor-price differentials can be temporary or exist in long-run equilibrium.

Factor mobility erodes temporary factor-price differentials.

Example: An increase in demand for steel workers.

- increases in their wages
- attracts workers from other industries
- wages then fall in steel industry and rise elsewhere
- the differential is eventually eliminated

The Creation and Erosion of Temporary Factor-Price Differentials



Equilibrium Differentials

Equilibrium differentials are not eliminated by factor mobility because neither workers nor jobs are identical.

Equilibrium differentials can be explained by intrinsic differences in the factors themselves.

In the case of labor, they can be explained by differences in the cost of acquiring skills and by the different non-monetary advantages of different occupations.

Equilibrium Differentials

Equilibrium factor-price differentials are also called compensating differentials. For example:

- intrinsic differences in skills or talents
- acquired differences (perhaps due to education)
- non-monetary differences in job characteristics

Hazard pay is an obvious example of a compensating differential.

Economic Rent

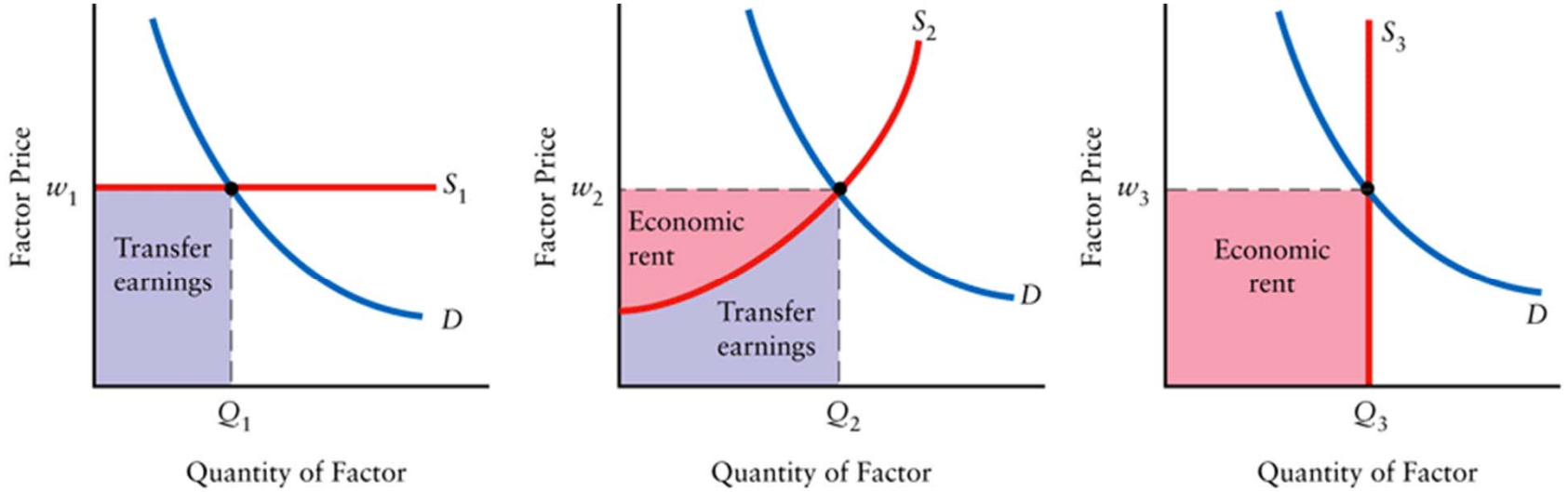
Factor payments are comprised of:

- transfer earnings: the amount necessary to secure the employment of the factor
- economic rent: any payment above the transfer earnings

For capital and land, transfer earnings are just payments from alternative uses.

For labor, transfer earnings also depend on the non-monetary attributes of the alternative jobs.

The Determination of Rent in Factor Markets



(i) Perfectly elastic supply

(ii) Positively sloped supply

(iii) Perfectly inelastic supply

Source:

- Lipsey, Ragan, Storer (2008)