

Factor market

Content

1. Comparing good/service market to factor market
2. Demand for factors of production
3. Supply for factors of production
4. Changes in factor market equilibrium

Reading list

Mankiw Ch. 18

└─ 1.1 Definition

Factor market

is a context where there is a trade of factors of production.

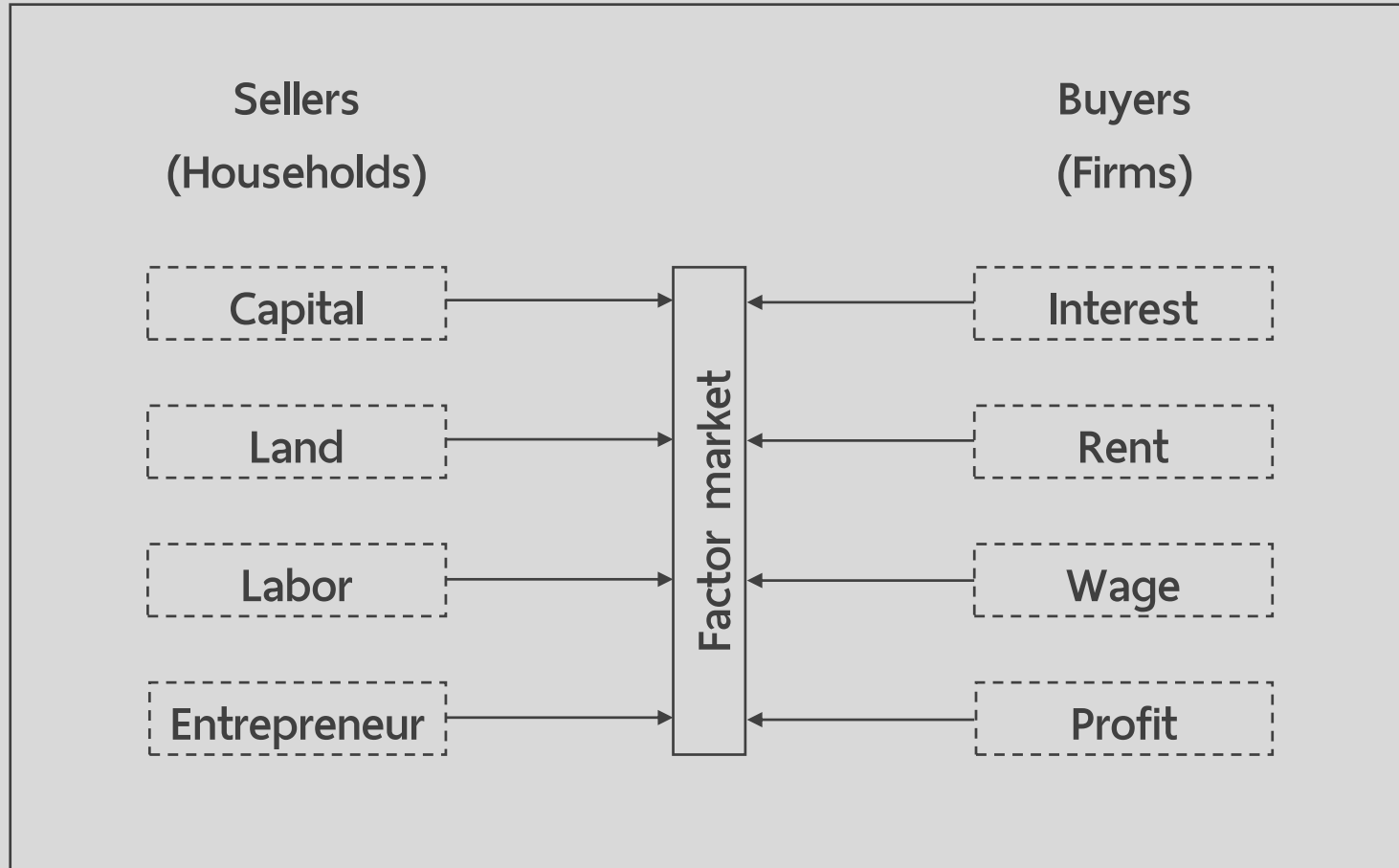
Components

◎ **Buyers are firms** in this case since firms are agents that gather all factors for productions of goods and services.

◎ **Sellers are households** in this case since households own factors of production.

Both buyers and sellers agree upon price and quantity in a factor of production market as in usual market.

1.1 Definition



1.2 Linkage between two markets

Good/service market

Expansion of the middle class >

Demand for housing increases >

Housing price hikes →

Factor market

Construction firms want to build more housing >

Workers are more demanded >

Higher wage

Some businesses may be affected >

Excess supply

Minimum wage is raised >

Labor costs more ←

1.2 Linkage between two markets

Good/Service marketBuyers
(Households)

- ⊙ Maximize utility
- ⊙ Marginal benefit = marginal cost
(marginal utility = price)

$$\frac{MU_x}{P_x} = \frac{MU_y}{P_y} = \dots = \frac{MU_k}{P_k}$$

Market demand

Sellers
(Firms)

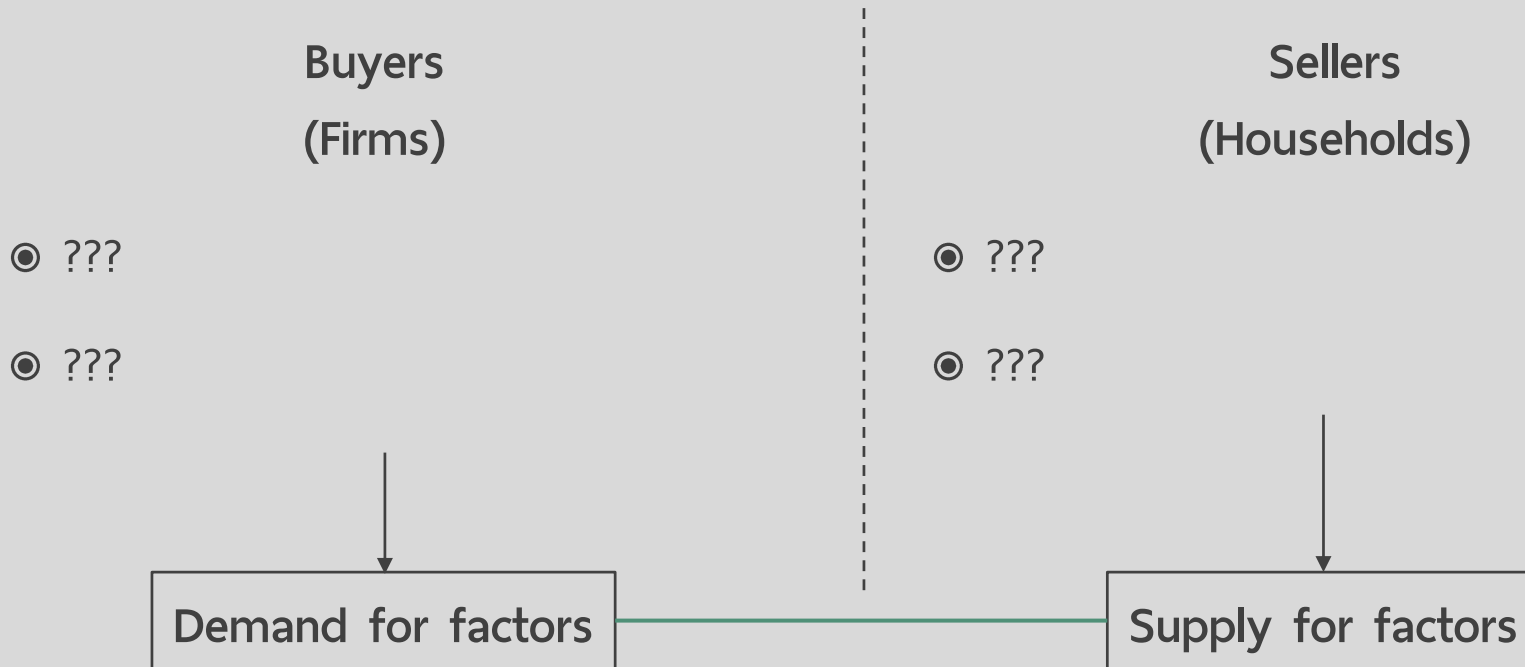
- ⊙ Maximize profit
- ⊙ Marginal benefit = marginal cost
(marginal revenue = marginal cost)

$$MR = MC$$

Market supply

1.2 Linkage between two markets

Factor market



The study of factor market focuses on how both buyers and sellers come up with demand and supply, and also equilibrium.

1.2 Linkage between two markets

What to consider?

- ⦿ Competition in factor market
- ⦿ Competition in good/service market (linked with factor market that we are studying)
- ⦿ Number of factors in a production

↳ 2.1 Definition

Demand for factor of production

is quantity demanded for a factor of production at different prices within a period of time.

Demand for factor of production is considered **derived demand**.

└ 2.1 Definition

Flow of thoughts

- ⦿ Factors of production are demanded by firms.
- ⦿ Firms tend to maximize profit.
- ⦿ Utilizing more factors increases (or decrease, depending stage of production) total output and cost.
- ⦿ Firms therefore consider marginal benefit and cost in order to choose how many unit of factors to hire/rent.

$$\begin{array}{c} \text{Marginal revenue of factor of production} \\ = \\ \text{Marginal cost of factor of production} \end{array}$$

└ 2.2 Marginal Revenue Product

Marginal revenue product (MRP)

is an incremental amount of **revenue** from adding 1 more unit of factor of production.

$$MRP = MP \times MR$$

- ◎ **MP** – marginal product from additional unit of factor
- ◎ **MR** – marginal revenue from selling additional product

Example If product market is perfectly competitive where firm's marginal revenue is 10 baht per unit of product and a firm hires additional labor that can produce 2 more unit of products, this unit of labor can generate $10 \times 2 = 20$ baht of revenue.

└ 2.2 Marginal Revenue Product

Value of marginal product (VMP)

is an incremental amount of **value** from adding 1 more unit of factor of production.

$$VMP = MP \times P$$

- ◎ **MP** – marginal product from additional unit of factor
- ◎ **P** – price of product

Example If product market is perfectly competitive where price is 10 baht per unit of product and a firm hires additional labor that can produce 3 more unit of products, this unit of labor can generate $10 \times 3 = 30$ baht of value.

2. Demand for factor market

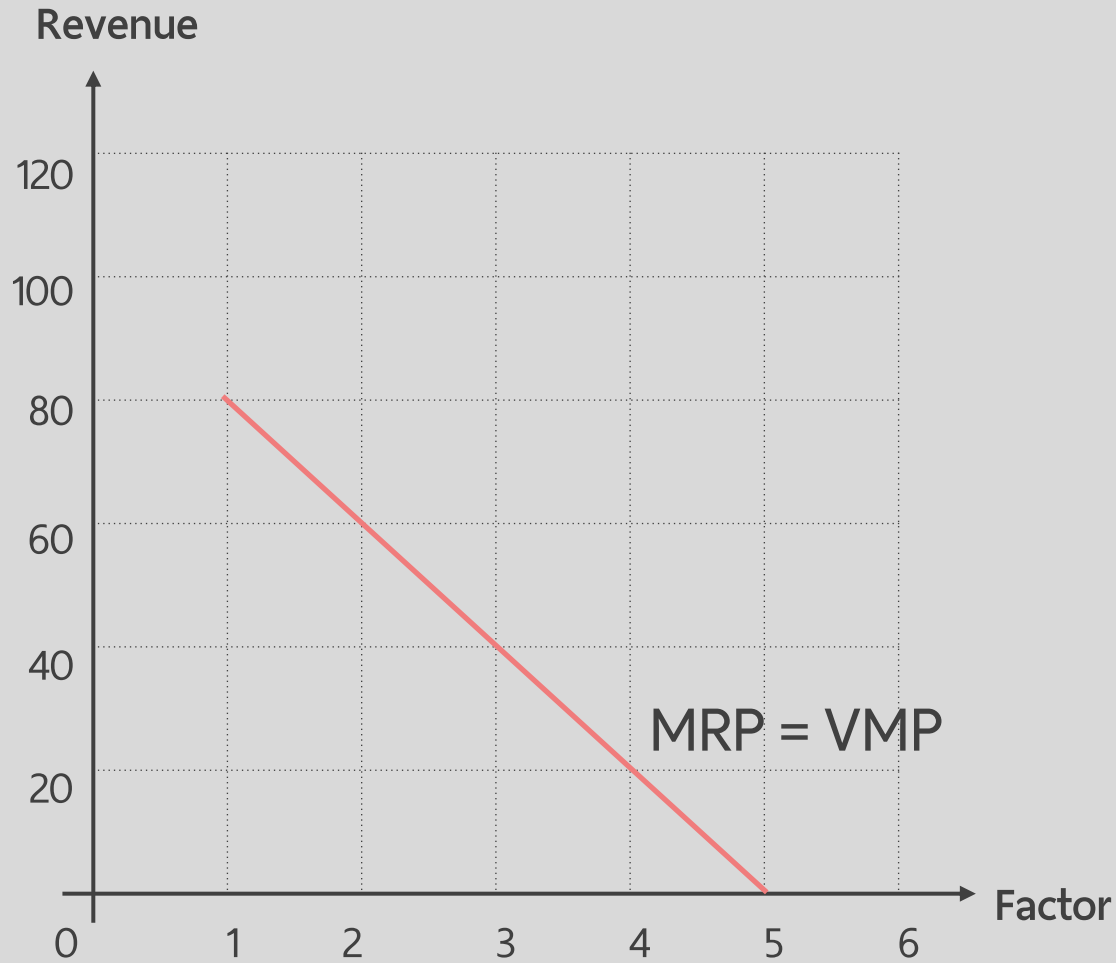
Factor Market

2.2 Marginal Revenue Product

Variable factor	Total product	Marginal product	Marginal revenue	Marginal revenue product	Value of marginal product
(L)	(TP / Q)	(MP)	(MR)	(MRP)	(VMP)
0	0	-	-	-	-
1	8	8	10		
2	14	6	10		
3	18	4	10		
4	20	2	10		
5	20	0	10		
6	18	-2	10		

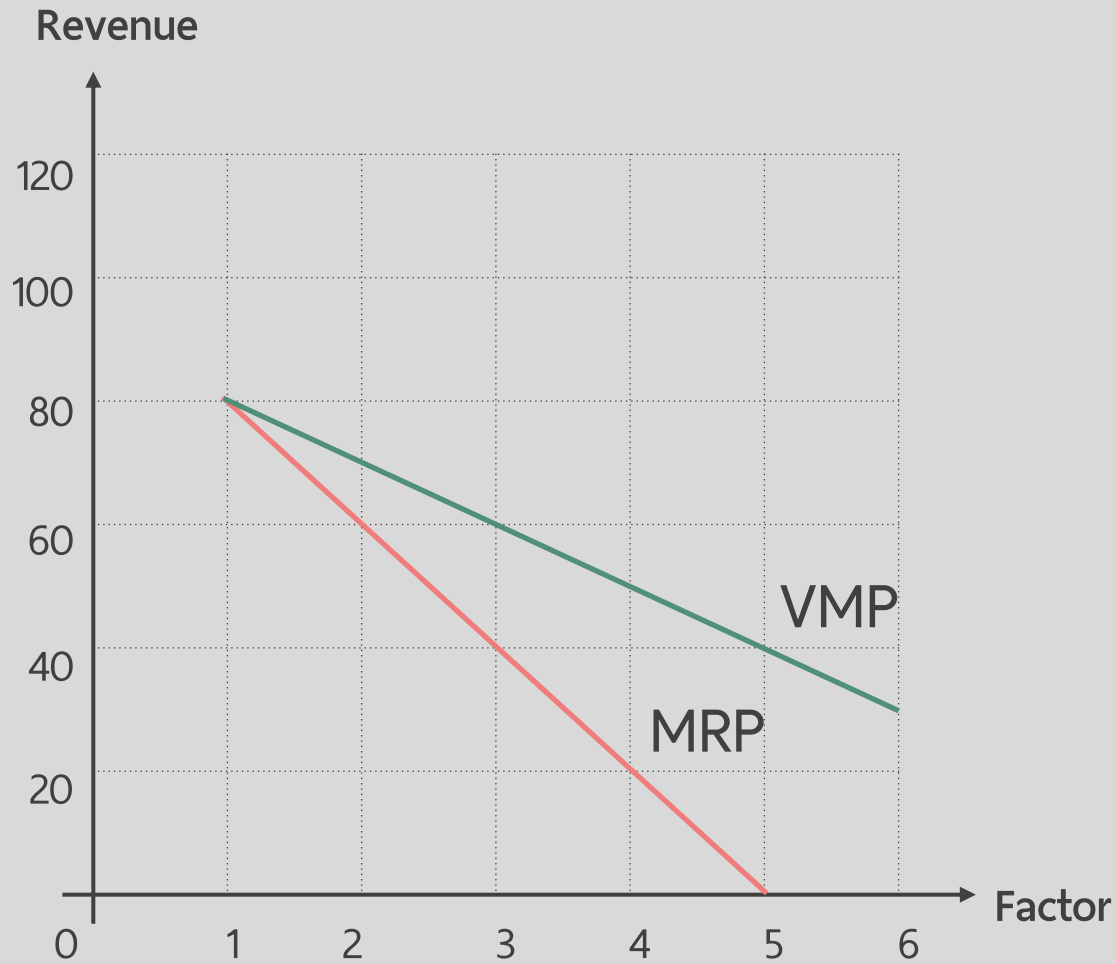
Product market: Perfect competition | Factor market: -

2.2 Marginal Revenue Product



Product market: Perfect competition | Factor market: -

2.2 Marginal Revenue Product



Product market: Monopoly | Factor market: -

2.3 Marginal Factor Cost

Marginal factor cost (MFC)

is an incremental amount of cost that a firm bears when increase one more unit of factor into a production.

$$MFC = \frac{\Delta TFC}{\Delta L}$$

- ◎ TFC – Total factor cost
- ◎ L – Number of factor (assumed to be only labor in this case)

Example A firm decides to hire one more labor, while keeping other factor constant. If labor market is perfectly competitive and wage is 20 baht daily, the marginal factor cost is $20/1 = 20$ baht.

2. Demand for factor market

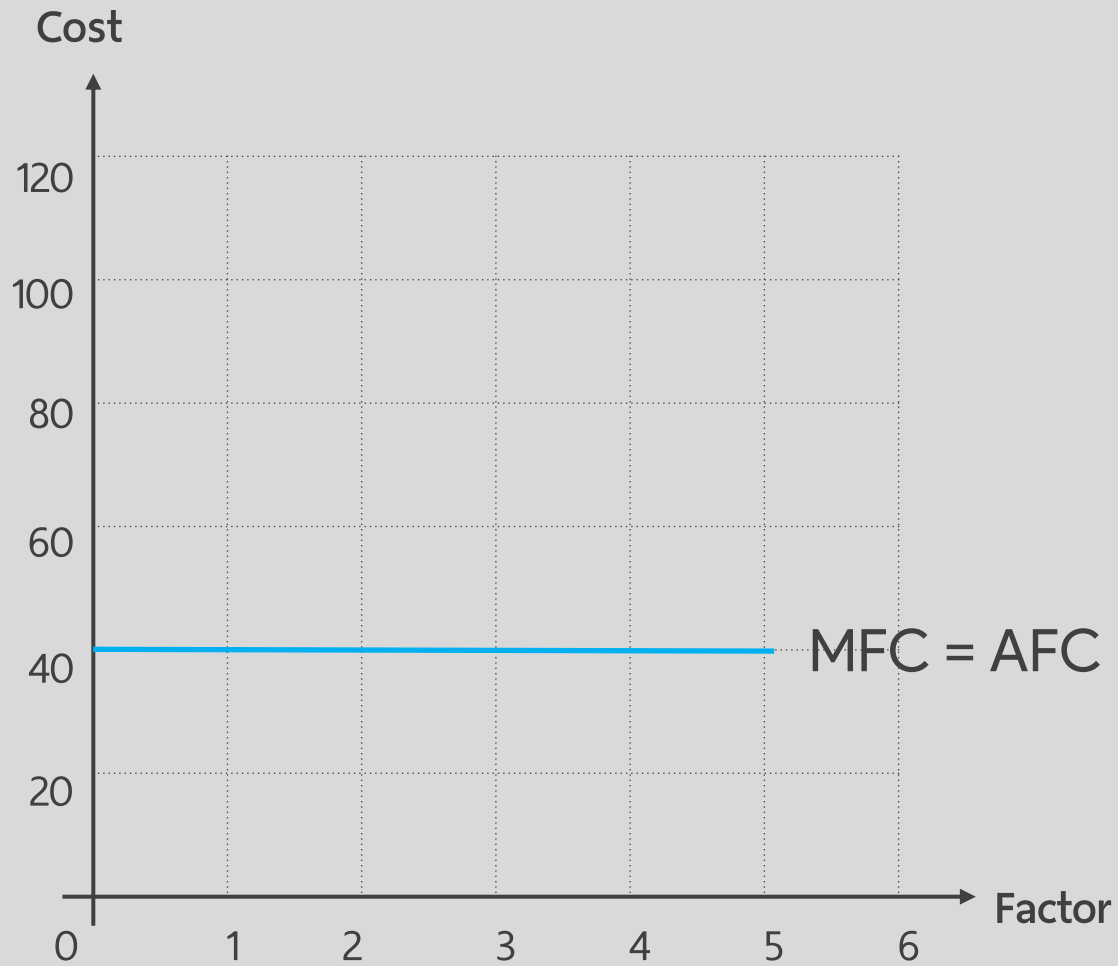
Factor Market

2.3 Marginal Factor Cost

Factor	Wage or average factor cost	Total factor cost	Marginal factor cost
(L)	(w or AFC)	(TFC)	(MFC)
1	40		
2	40		
3	40		
4	40		
5	40		
6	40		

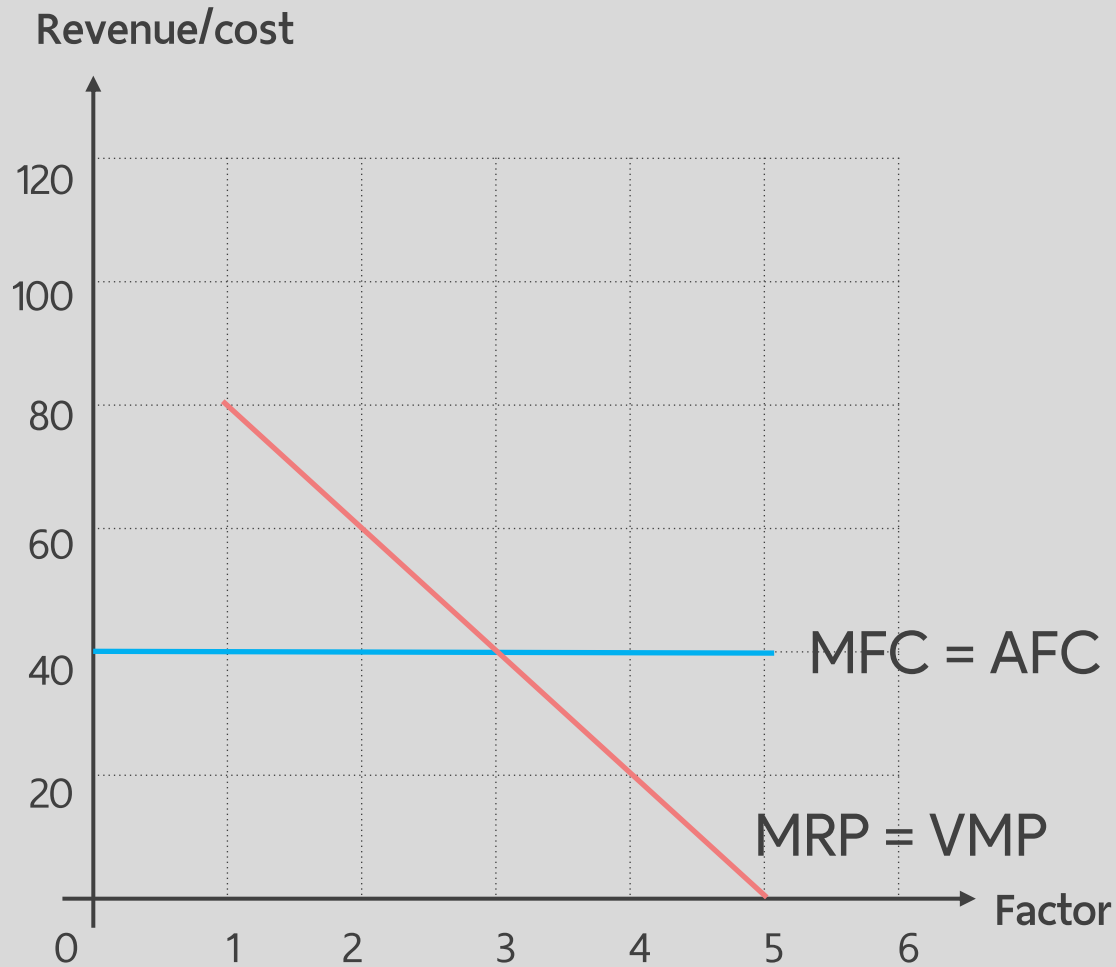
Product market: - | Factor market: Perfect competition

2.3 Marginal Factor Cost



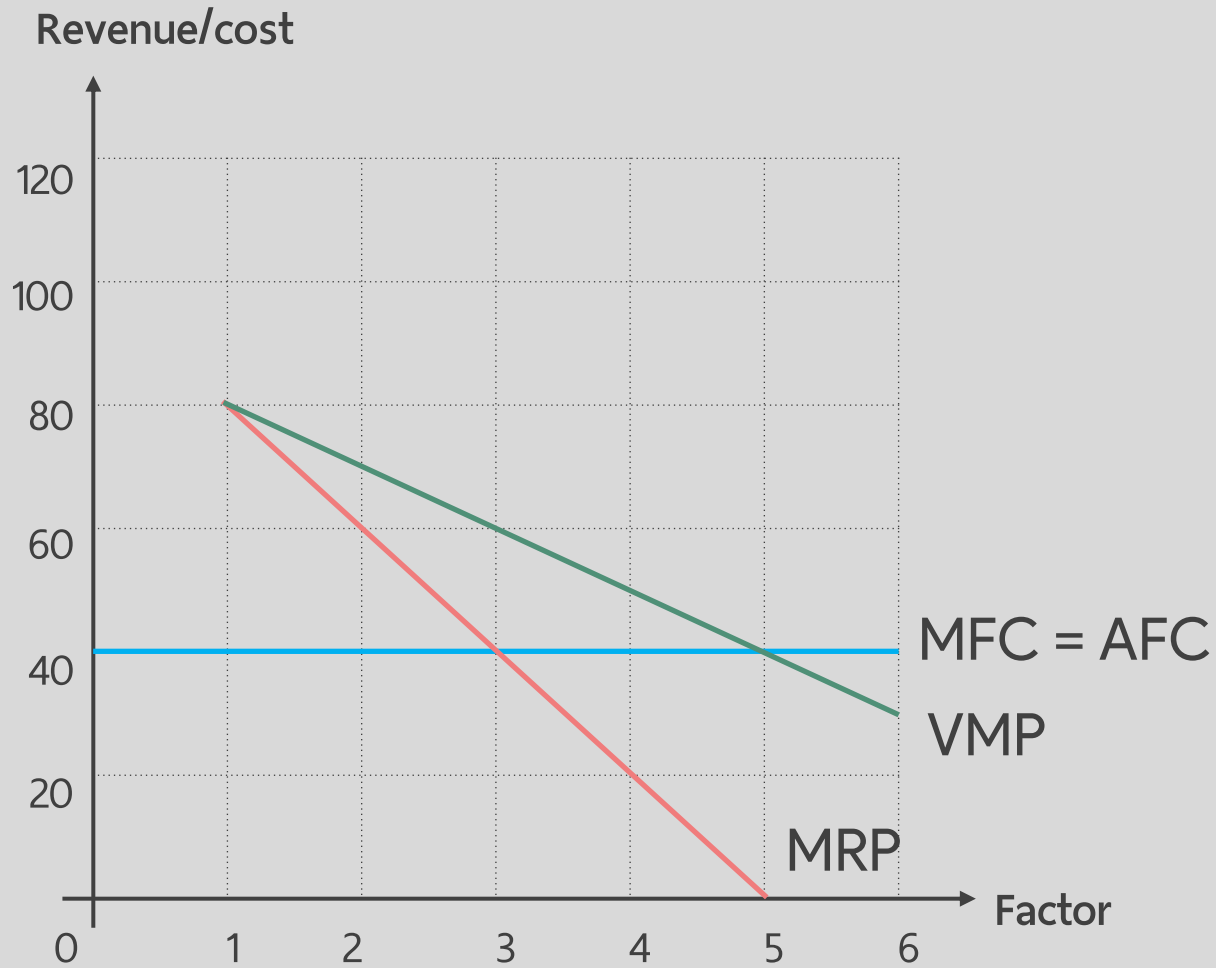
Product market: - | Factor market: Perfect competition

2.4 Equilibrium for demand



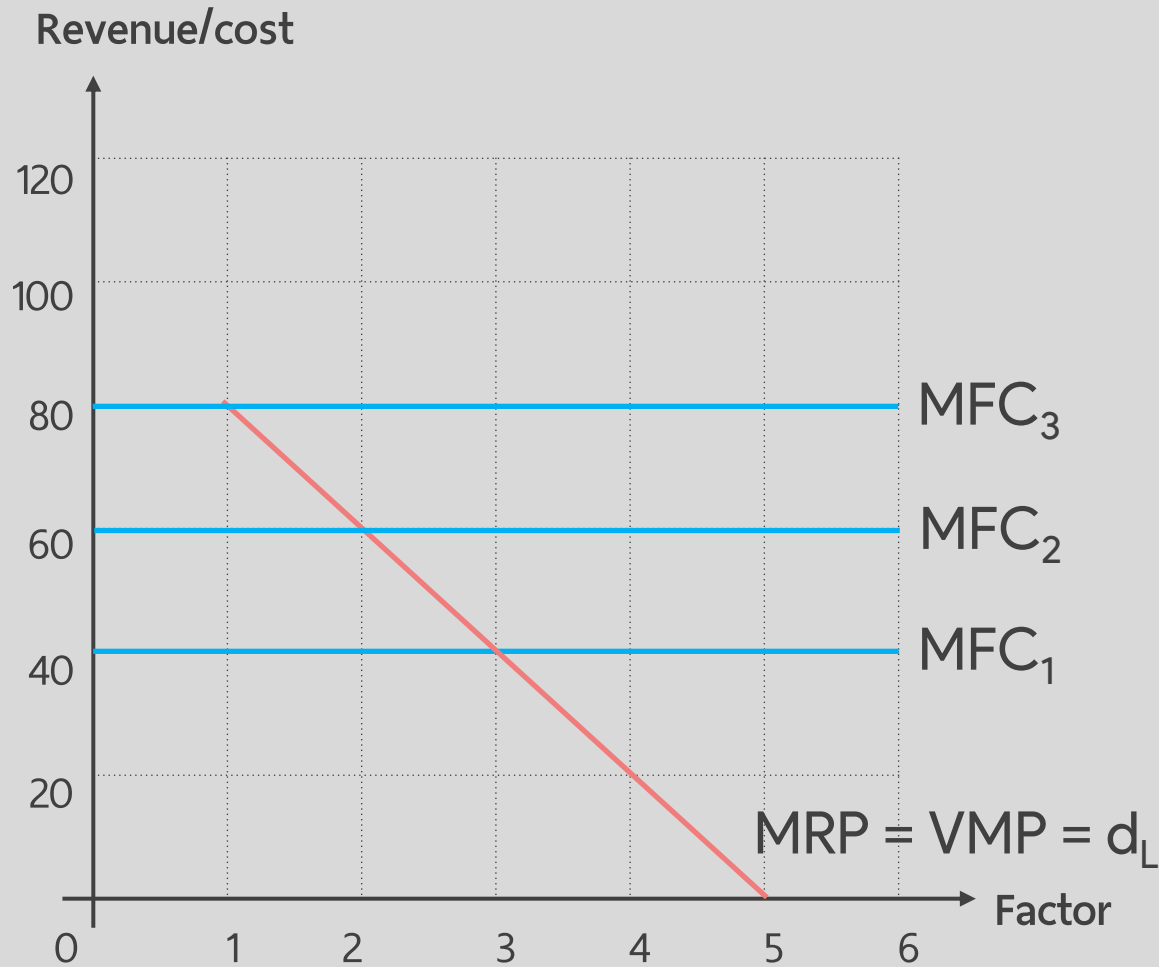
Product market: Perfect competition | **Factor market:** Perfect competition

2.4 Equilibrium for demand



Product market: Monopoly | Factor market: Perfect competition

2.4 Equilibrium for demand



Product market: Perfect competition | Factor market: Perfect competition

└─ 3.1 Definition

Supply for factor of production

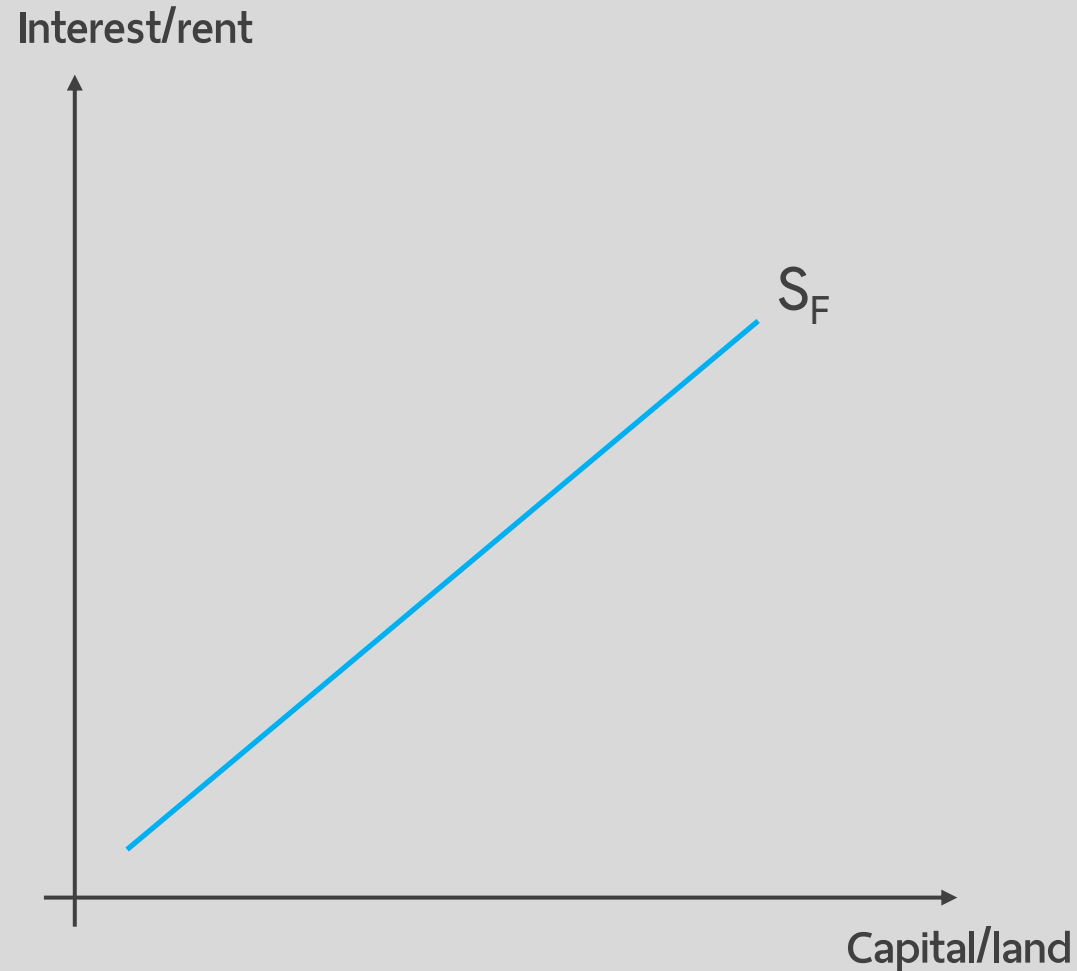
is quantity supplied at different price (of that factor) within a period of time.

- ◎ Supply for factors of production that **are not** human. (capital/land)
- ◎ Supply for factors of production that **are** human. (labor/entrepreneur)

3.2 Non-human factor supply

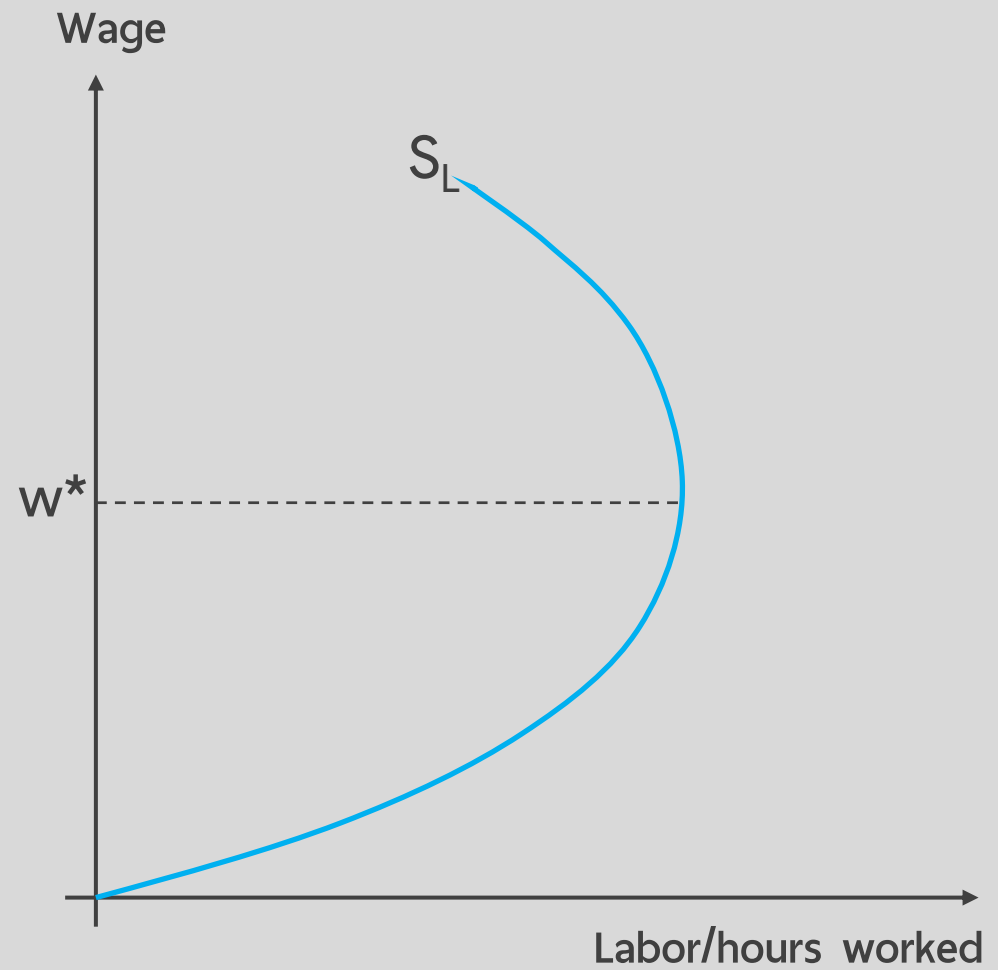
- Interest rate and rent are opportunity cost for capital and land respectively. Therefore, the more interest rate and rent increase, the more quantity is supplied.

- If total supply of land is limited in the long-run, how would the supply look like?



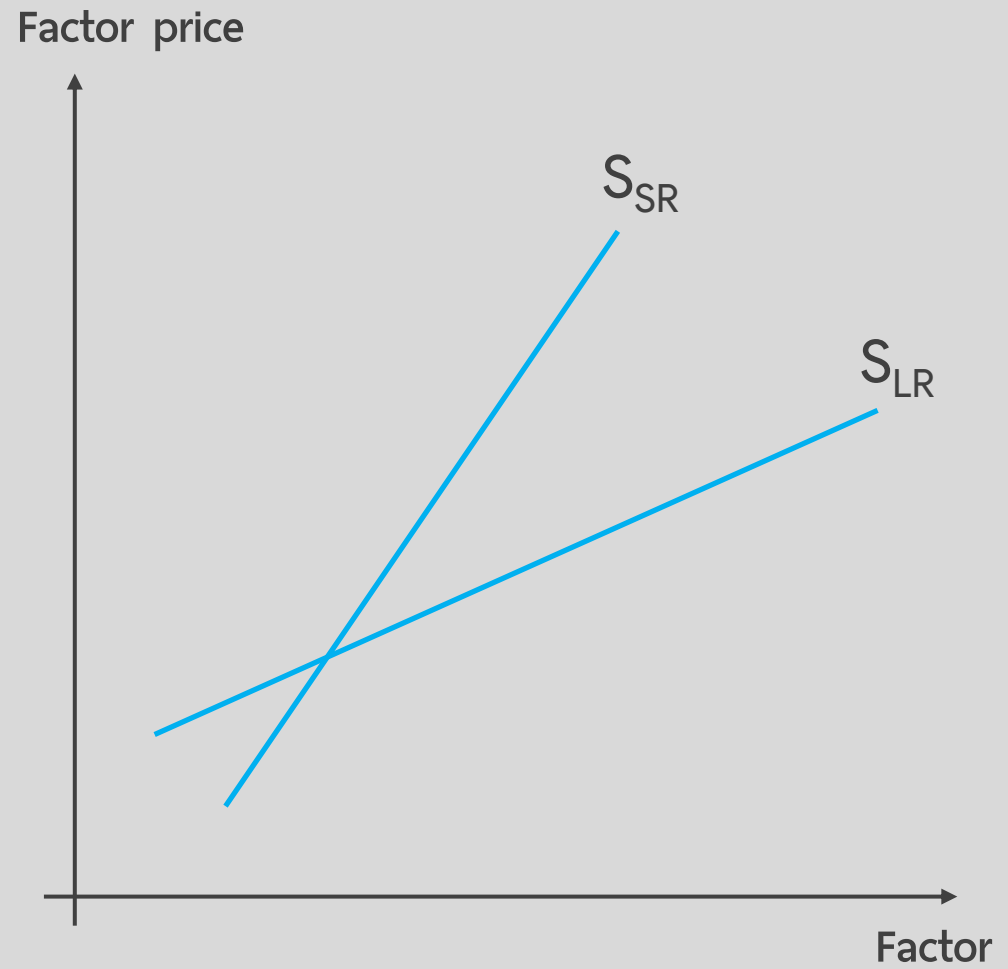
3.3 Human factor supply

- ⦿ Labor decides their optimal hour worked by weighting consumption and leisure.
- ⦿ At low wage, price of leisure is relatively expensive, substitution effect is stronger than income effect. When wage increases within this range, hours worked also increases.
- ⦿ At certain point, income effect become stronger. When wage increase within this range, labor decides to increase their leisure.

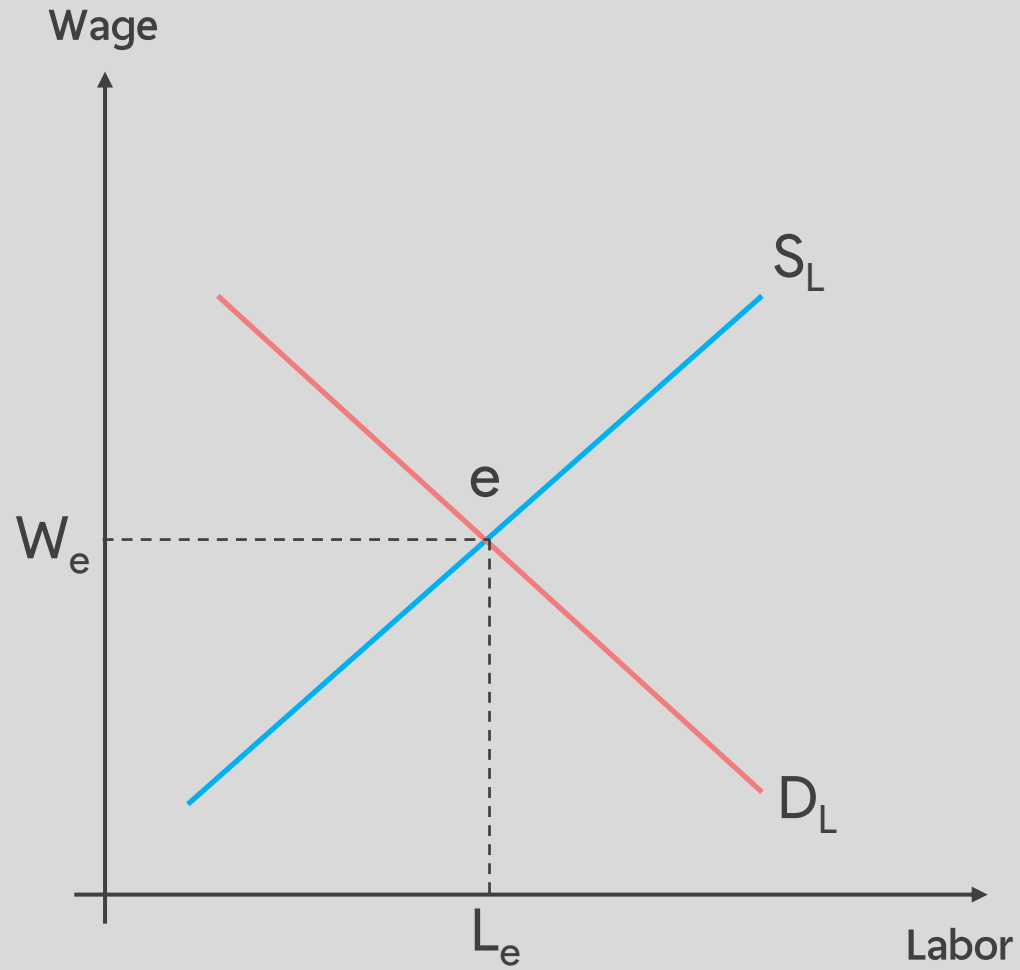


3.4 Short-run versus long-run

- ◉ In the short-run, factor supply is less elastic because it usually takes time to adjust quantity.
- ◉ In the long-run, factor supply tends to be more elastic.

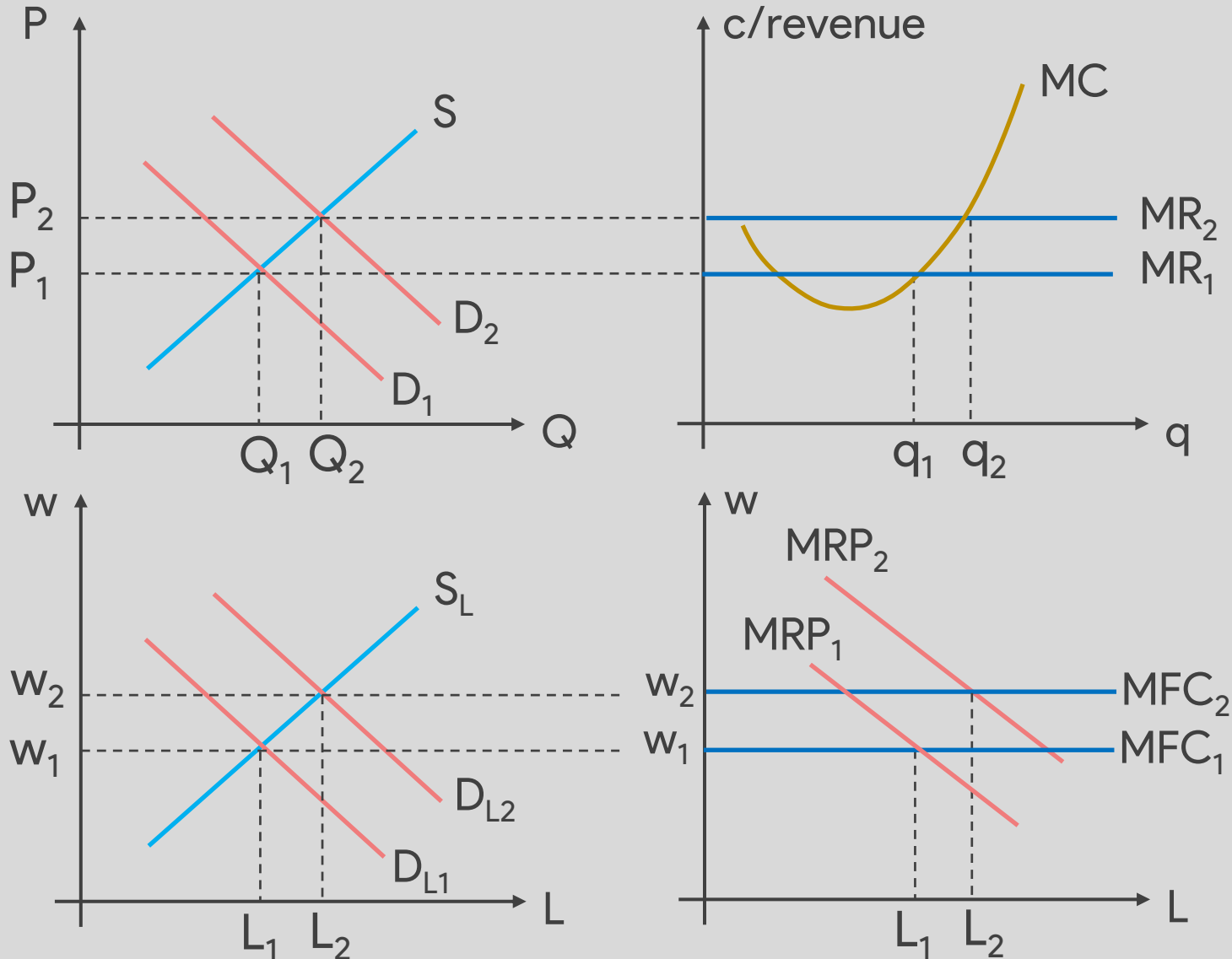


3.5 Equilibrium in labor market



3.5 Equilibrium in labor market

- Supposed that there is a shift in demand for a product,



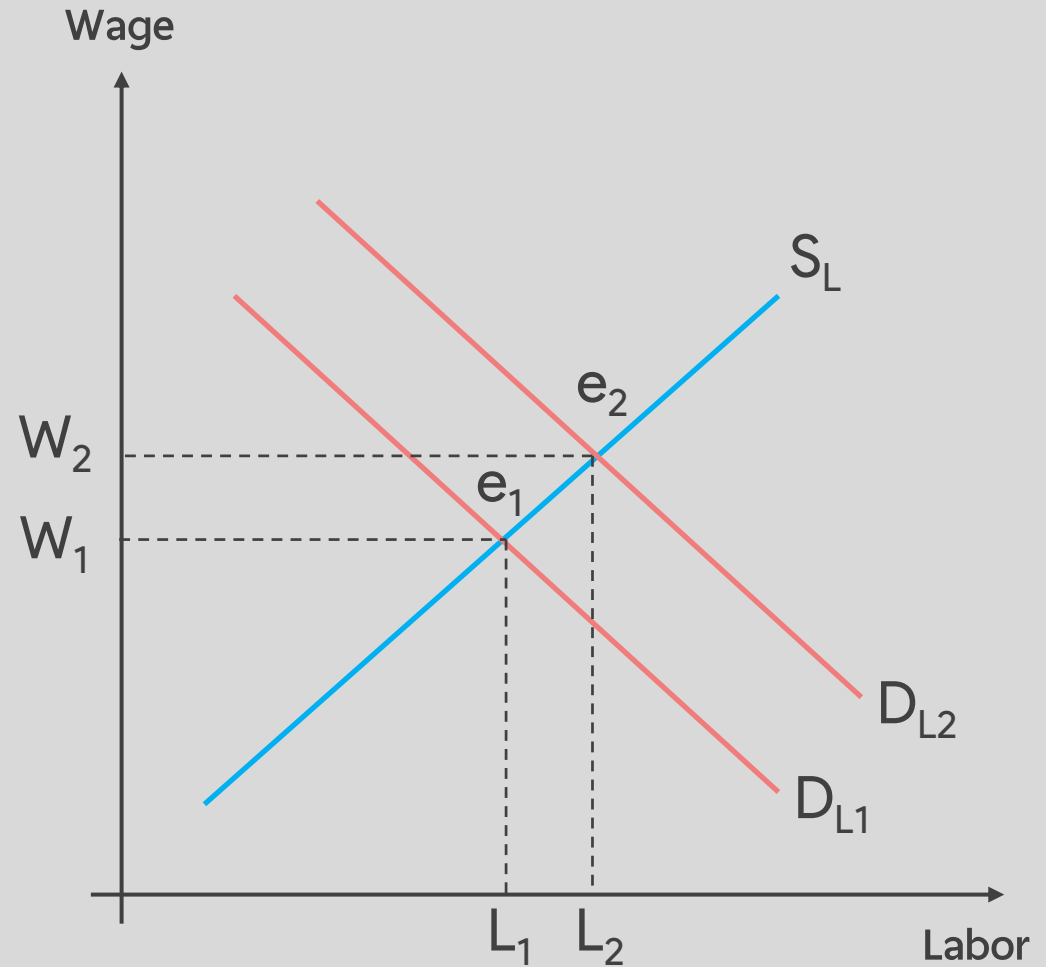
3.5 Equilibrium in labor market

Flow of thoughts

- ◉ Demand shift raises price and quantity demanded in product market (1), pushes price up to P_2 .
- ◉ Marginal revenue for firm raises to MR_2 , intersecting with higher point of MC hence optimal quantity is raised (2).
- ◉ Demand for labor increases, shifting D_{L1} to D_{L2} . Wage goes up (3).
- ◉ Marginal revenue product shifts upward from marginal revenue in product market from MRP_1 to MRP_2 . Marginal factor cost also increases from wage from MFC_1 to MFC_2 , shifting the equilibrium to the right and upward (4).

3.6 Demand and supply shifts in labor market

- ⦿ Increase in labor productivity
- ⦿ Change in relative price of substituting factor



3.6 Demand and supply shifts in labor market

- ⦿ Change in taste for leisure and consumption
- ⦿ Preference for career
- ⦿ Structure of population

