

# *Edexcel*

## *A Level*

### *Economics*

*(Code: WEC11 01)*

#### *Unit 03-Section 4*

## *Labour markets*



## Chapter 15 – The demand for labour

### THE DOWNWARD SLOPING DEMAND FOR LABOUR CURVE

Demand for labour is a **derived demand**, which means that the demand for labour is a result of the demand for the goods or services that the workers produce.

If demand for plastic chairs decreases, firms producing chairs will need to reduce production, requiring fewer workers. The demand curve for labor indicates how many workers will be hired at a given wage rate, with a firm hiring 100 workers at \$2 per hour and 50 at \$200 per hour.

### THE SHORT-RUN DEMAND FOR LABOUR

Labour is assumed to be a variable factor of production, while all other factors are fixed. As extra workers are employed, total output, or total physical product, increases.

However, **marginal physical product**, the number of extra units of output a worker produces, starts to decline after the employment of the second worker. So diminishing marginal returns set in with the third worker. Assume that the firm is in a perfectly competitive industry and therefore faces a horizontal, perfectly elastic demand curve. This means that the firm can sell any quantity of its product at the same price per unit. In Table 1, it is assumed that the price of the product is \$10.

**Marginal revenue product** can then be calculated - this is the addition to revenue from the employment of an extra worker.

Per week						
1	2	3	4	5	6	7
Labour input (workers)	Total output (units)	Marginal physical product (units)	Price of product \$	Marginal revenue product (column 3 × column 4) \$	Wage rate per worker \$	Contribution (column 5 – column 6) \$
1	8	8	10	80	70	10
2	17	9	10	90	70	20
3	25	8	10	80	70	10
4	32	7	10	70	70	0
5	38	6	10	60	70	-10
6	43	5	10	50	70	-20

▲ Table 1

It is now possible to calculate how many workers a firm will employ. The contribution to the payment of fixed costs and the earning of profit of each worker is the difference between the marginal revenue product of the firm and the cost to the firm of the worker. Assume that the firm is able to employ any number of workers at a wage rate of \$70. The contribution of the first worker is \$10, the worker's marginal revenue

### THE DEMAND CURVE FOR LABOUR

The marginal revenue product curve for labour is a downward sloping or negative relationship, as it declines as output increases. It represents the number of workers a firm will employ at any given wage rate, and is the firm's demand curve for labour. This curve is also the price/quantity diagram, where the price of labour is the wage rate and quantity is the quantity of labour employed.

FIGURE 1

**The MRP curve is the demand curve for a factor**

The MRP curve shows the maximum price a firm will be prepared to pay for an extra unit of a factor of production and therefore it is the demand curve for that factor.

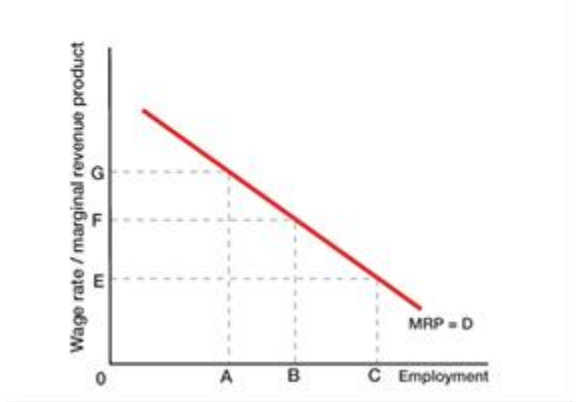
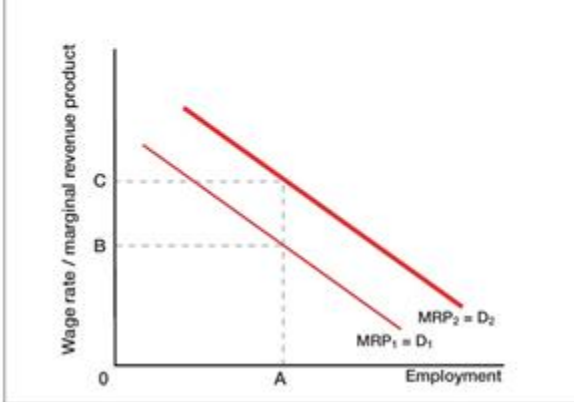


FIGURE 2

**A rise in the demand for labour**

A rise in the marginal productivity of labour at any given level of employment will lead to a shift of the MRP or demand curve for labour to the right.

**SHIFTS IN THE DEMAND CURVE FOR LABOUR**

The demand curve for labour can shift to the left or right if the marginal revenue product of a given quantity of labour changes. There are two main reasons why marginal revenue product may change given that marginal revenue product equals marginal physical product multiplied by the price of the product:

**The productivity of labour** The physical productivity (physical output per worker) of labour may change. If car workers increase their output from four cars per day to five cars per day, their marginal physical product will increase and hence so too will their marginal revenue product. Employers will be prepared to pay more to workers who are more productive.

**The price of the product** - The demand for a product can change due to changes in market prices. An increase in labor productivity or product price can increase demand for labor, shifting the demand curve to the right. Conversely, a decrease in productivity or product price can reduce demand, shifting the demand curve to the left. For instance, if OA labor is employed, its MRP changes from OB to OC.

**WAGE RATE RELATIVE TO THE PRICE OF CAPITAL**

Economic theory suggests that the higher the price of labour, the less labour firms will hire.

- In the long run, other things remaining equal, firms can vary all factors of production. The higher the wage rate, the more likely it is that firms will substitute machines for workers and hence the lower the demand for labour.
- In the short run, firms have a fixed stock of capital and need to produce with limited resources. As more workers are added, the last worker's productivity decreases, requiring a lower wage rate to encourage hiring. The demand curve for labor is likely downward sloping both in the long and short run.

**THE LONG-RUN DEMAND FOR LABOUR**

In the long run, factors of production are variable, and firms have complete freedom to choose their techniques. In developing countries, labor is cheap, while in developed countries, capital is expensive.

## PERFECT AND IMPERFECT COMPETITION

So far it has been assumed that the employer is supplying goods in a perfectly competitive market. This is because it has been assumed that the firm can supply any quantity of goods to the market at the same price per unit (i.e. the firm faces a horizontal demand curve). The marginal revenue product curve falls because of diminishing returns.

However, if the employer supplies goods in an imperfectly competitive market, then it faces a downward sloping demand curve for its product. If it expands output, price per unit sold will fall. Consider Table 1 again.

## FACTORS THAT INFLUENCE THE ELASTICITY OF DEMAND FOR LABOUR

The elasticity of demand for labour is a measure of the responsiveness of the quantity demanded of labour to changes in the price of labour (i.e. the wage rate).

$$\text{elasticity of demand for labour} = \frac{\text{percentage change in quantity of labour demanded}}{\text{percentage change in the wage rate}}$$

Remember that the relationship is negative (as one figure rises the other will fall and vice versa) because the demand curve is downward sloping.

For example, if elasticity of demand for labour is 2 and wage rates increase by 10% then, all other things being equal, the demand for labour will fall by 20%.

$$\frac{\text{(demand for labour falls by 20\%)}}{\text{(wage rates increase by 10\%)}} = \frac{-20}{+10} = -2 \text{ (elastic demand for labour)}$$

For example, if demand for labour falls by 2% when wage rates rise by 20%, all other things being equal, then elasticity of demand for labour will be 0.01 (see Figure 3).

$$\frac{\text{(demand for labour falls by 2\%)}}{\text{(wage rates rise by 20\%)}} = \frac{-2}{+20} = -0.1 \text{ (inelastic demand for labour)}$$

## TIME

The longer the adjustment period, the easier it is to substitute labour for other production factors. In the short term, a firm may employ the same number of workers, face financial penalties, or avoid losing skilled staff due to their difficulty to replace.

## AVAILABILITY OF SUBSTITUTES

The easier it is to substitute other factors, such as capital for labour, the greater the response by firms to a change in wage rates will be. For example, the easier it is to substitute capital for labour, the more elastic the elasticity of demand for labour will tend to be.

## ELASTICITY OF DEMAND FOR THE PRODUCT

Labour demand is a derived demand, directly related to the elasticity of demand for the product produced in an industry. Inelastic demand, like gas or electricity, can cause a collapse in steel workers' demand. Conversely, more elastic demand, like steel, can lead to increased prices and job losses. For example, a steel company with highly elastic demand may face a loss of orders due to unmatched wages.

FIGURE 3

## Elasticity of demand for labour



## SUBJECT VOCABULARY

**derived demand** demand for labour is derived from the demand for the product

**elasticity of demand for labour** the responsiveness of the quantity demanded of labour to changes in the price of labour, the wage rate. It is measured by the formula

$$\frac{\% \text{ change in quantity of labour demanded}}{\% \text{ change in the wage rate}}$$

**marginal physical product (MPP)** the physical addition to output of an extra unit of a variable factor of production

**marginal revenue product (MRP)** the value of the physical addition to output of an extra unit of a variable factor of production. In a perfectly competitive product market, where marginal revenue equals price, it is equal to marginal physical product times the price of the good produced

**total physical product (TPP)** the total output of a given quantity of factors of production

**unit labour cost** cost of employing labour per unit of output or production

## Chapter 16 – The supply of labour

### SUPPLY OF LABOUR TO AN OCCUPATION

The supply of labour is the number of workers willing and able to work in a particular job or occupation for a given wage. The supply of labour to a particular occupation is affected not just by monetary considerations.

An occupation can have an increase in the number of hours worked by its labour force in two ways:

- it can increase the number of hours worked by its existing labour force
- it can recruit new workers.

Wage rates may increase labor supply in an occupation, but they attract new workers from other occupations or the unemployed. The supply curve for an occupation is upward sloping, with firms' ability to recruit new workers outweighing any disincentive effect on existing workers.

FIGURE 1

## Labour supply curve for a particular occupation



## SHIFTS IN THE SUPPLY OF LABOUR CURVE

There are a number of factors that influence the supply of labour to a particular occupation.

### SIZE OF POPULATION

The **working population** of a country is the number of people who are of working age, which is between the school leaving age and the state retirement age, and are willing and able to work. The higher the working population the more people who could enter the occupation and increase supply.

However, it is not just the total number of people but also the number of people who are **economically active**, that is the number of workers in the workforce who are in a job or are unemployed. If there are fewer people who are part of the workforce then the supply of labour to any particular occupation is likely to be lower.

Therefore, the **activity or participation rate** is an important influence.

The age structure of the population is also important, for example if the total population increases but it is due to an **aging population** as people live longer, then the supply of labour may not increase. Even though there are more people in the population, there are not more people who are active and are working.

### NET MIGRATION

A positive net migration, i.e. more people entering the country than leaving it, may increase the supply of labour to a particular occupation. However, if there is a negative net migration then the supply of labour to an occupation may decrease.

### INCOME TAX RATES

If income tax rates are increased, it may make working less attractive as **disposable income** reduces. Income tax can lead to workers leaving low-paying jobs or finding higher-wage jobs, reducing the supply of labor to low-paying occupations. Progressive income tax may discourage workers from entering dangerous or unpleasant jobs, making disposable income unattractive and decreasing labor supply. High marginal tax rates, such as 50-60%, can discourage workers from working additional hours. If low-income earners don't pay income tax, they may receive a pay rise but also start paying income tax, causing fiscal drag. Overall, progressive income tax can negatively impact labor supply.

### LEVEL OF WELFARE BENEFITS

Welfare benefits impact occupations with wages below government wage rates. Increased welfare payments may decrease labor supply, while low welfare benefits increase supply to low-paid occupations. Reductions may increase labor supply, as people find work worthwhile. High wage occupations are unlikely to be affected by welfare benefits.

### GOVERNMENT REGULATIONS

Artificial labor supply restrictions, like minimum entry requirements, can restrict labor supply and increase pay levels in professions like legal services, teaching, and medicine. These restrictions can reduce labor supply if qualifications are more difficult or increase supply if more training opportunities are made available.

### TRADE UNIONS

Trade unions have an influence on wage levels in particular occupations and therefore may attract workers from other occupations that do not have trade union membership and have lower wage rates. Occupations that have trade unions representing the workers, on average, tend to have higher wage rates than occupations that do not have trade unions present.



## ELASTICITY OF SUPPLY OF LABOUR

The elasticity of supply of labour is a measure of the responsiveness of the quantity of labour supplied to changes in the price of labour (i.e. the wage rate). It has a positive relationship as the supply of labour curve is upwards sloping. This means that as the wage rate increases then so does the supply of workers willing to increase their supply of labour to the market.

$$\text{elasticity of supply of labour} = \frac{\text{percentage change in quantity of labour supplied}}{\text{percentage change in wage rate}}$$

For example, if the wage rate increases by 10% then the quantity of labour supplied will increase by 20% if the elasticity of supply of labour is 2 (Figure 3).

(20% increase in the quantity of labour supplied)  $\div$  (10% increase in the wage rate)  $= +2$  (elastic supply of labour)

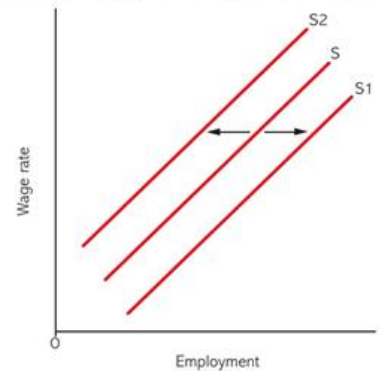
For example, if the wage rate increases by 25% then the quantity of people willing to supply their labour will increase by 12.5% if the elasticity of supply of labour is +0.5.

(12.5% increase in the quantity of labour supplied)  $\div$  (25% increase in the wage rate)  $= +0.5$  (inelastic supply of labour)

FIGURE 2

### Shifts in the supply curve

Figure 2 shows shifts in the supply of labour. An increase in supply is shown by the shift from S to S1 and a decrease in supply is shown by a shift from S to S2.



## THE AVAILABILITY OF SUITABLE LABOUR IN OTHER INDUSTRIES

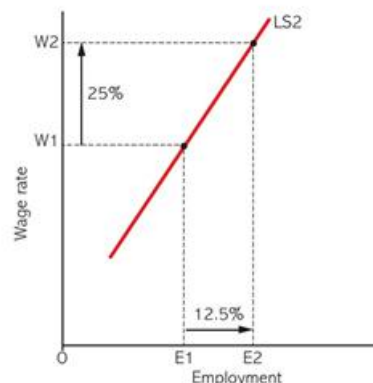
Engineering companies can easily attract unskilled workers from other industries due to a large pool of workers. Schools face difficulties in recruiting teachers due to limited qualified workers. The elasticity of supply for workers suitable for multiple industries is more elastic. In the short run, supply may be less elastic, but can be expanded over time by increasing teacher training courses.

## THE EXTENT OF UNEMPLOYMENT

The higher the level of unemployment, the more elastic the elasticity of supply is likely to be. With high unemployment, firms are more likely to be able to recruit workers at the existing real wage rate from the pool of the unemployed (see Student Book 1, Chapter 23).

FIGURE 3

### Elasticity of supply of labour



Where jobs require specific skill and training, the labour supply will be more inelastic.

### SUBJECT VOCABULARY

**activity or participation rate** the percentage or proportion of any given population in the labour force

**aging population** where there is an upwards shift in the average age of the population of a country so that there is a growing number of people who are older than the standard working age

**demographics** the statistics of the characteristics of a population who live in a particular area or country; examples of the characteristics that can be included are age, income, education, gender, ethnicity

**disposable income** household income over a period of time including state benefits, less direct taxes

**economically active** the number of workers in the workforce who are in a job or are unemployed

**net migration** the difference between emigration and immigration

**supply of labour to an occupation** the number of workers willing and able to work in a particular job or occupation for a given wage rate

**underemployment** where people are not able to work as many hours as they would like, or are in jobs that are below their skill level

**welfare benefits** money paid by a government to give financial benefits to people who are ill, unemployed, on a low income or too old to work

**working population size** of the population aged between the school leaving age and the state retirement age

## Chapter 17 THE DETERMINATION OF WAGE RATES IN COMPETITIVE AND NON-COMPETITIVE MARKETS

### LABOUR MARKET EQUILIBRIUM

Prices are determined by demand and supply. So the price of labour, the wage rate, is determined by the demand for and the supply of labour.

The demand curve for labour in a particular occupation is the marginal revenue product curve of labour. This is downward sloping, indicating that more labour will be demanded the lower the wage rate. The supply curve of labour to a particular occupation is upward sloping, indicating that more labour will be supplied if wage rates increase. This gives an equilibrium wage rate of OA in Figure 1. OB units of labour are demanded and supplied.

### CHANGES IN THE EQUILIBRIUM WAGE AND QUANTITY OF LABOUR

The demand and supply curves for labour can shift for a variety of reasons, giving new equilibrium wage rates and levels of employment in the industry/occupation. The demand curve for labour will move to the right showing an increase in the demand for labour if the marginal revenue product of labour increases. This might occur if:

- productivity improves, perhaps due to changing technology or more flexible working practices, increasing output per worker
- there is a rise in the selling price of the product, increasing the value of the output of each worker
- the price of capital increases, leading to a substitution of labour for capital.

### ELASTICITIES OF DEMAND FOR AND SUPPLY OF LABOUR

The elasticities of demand and supply of labour impact wage rates and employment in a market. In an inelastic labour market, an increase in demand leads to a significant wage increase, while a decrease in employment. Conversely, a decrease in demand results in a significant wage decrease. The lower the elasticity of demand, the greater the wage rate change and the smaller the employment change.

FIGURE 1

**Equilibrium wage rate in an industry/occupation**  
The equilibrium wage rate is OA while the level of employment in equilibrium is OB.

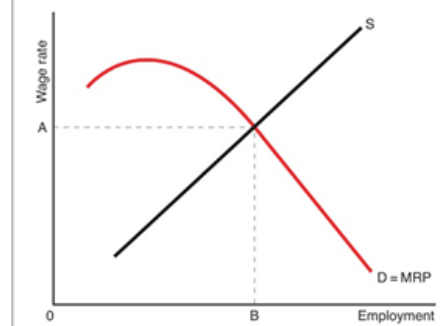
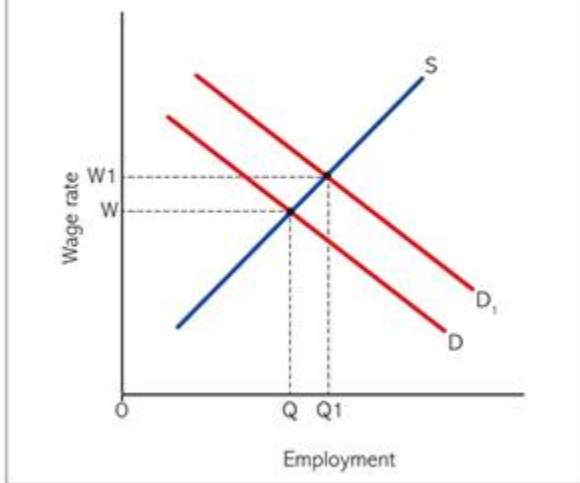




FIGURE 2

Figure 2 shows an increase in demand for labour,  $D$  to  $D_1$ , leading to an increase in the wage rate from  $OW$  to  $OW_1$  and an increase in quantity of labour from  $OQ$  to  $OQ_1$ .

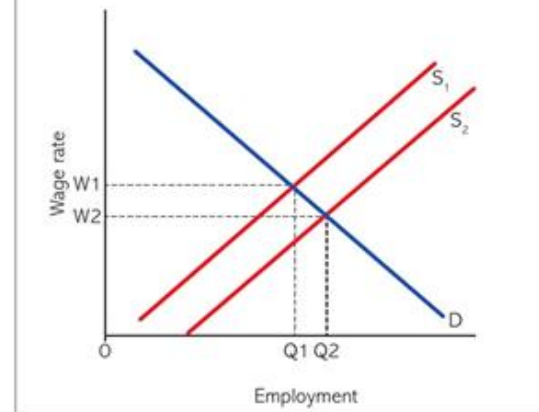


The supply curve might move to the right, showing an increase in supply, if:

- there is an increase in the number of workers in the population as a whole, perhaps because of changing demographic trends, or because government alters tax and benefit levels, increasing incentives to work
- wages or conditions of work deteriorate in other industries, making conditions relatively more attractive in this industry/occupation.

FIGURE 3

This figure shows an increase in supply of labour,  $S_1$  to  $S_2$  leading to a decrease in the wage rate from  $OW_1$  to  $OW_2$  and an increase in quantity of labour from  $OQ_1$  to  $OQ_2$ .



### WHY WAGE RATES DIFFER

In the real world, wage rates differ. One important reason is because labour is not homogeneous or identical. Each worker is a unique factor of production, possessing a unique set of employment characteristics such as:

**age whether young, middle aged or old**

**education, training and work experience**

**ability to perform tasks** - including how hard they are prepared to work, their strength and skill or intelligence.

Wage rates also differ because workers do not necessarily seek to maximise wages. Wages are only part of the **net benefit** workers gain from employment. Workers in dangerous, unpleasant, repetitive jobs with limited promotion opportunities may seek higher wages. Market forces lead to wage equality, but not wage rates. Labor mobility is limited in southern Italy, causing unemployment and low wages. This is due to the lack of perfect knowledge within the labor market and other market imperfections.

### PERFECTLY COMPETITIVE LABOUR MARKETS

In a perfectly competitive labour market, there is a large number of small firms hiring a large number of individual workers. For the individual firm operating in such a market:

- the demand curve for labour, the marginal revenue product curve of labour, is downward sloping
- the supply curve of labour is perfectly elastic and therefore horizontal; the firm can hire any number of workers at the existing industry wage rate.

How many workers should this type of firm employ? If a worker costs \$200 per week, but increases revenue net of all other costs by only \$150, then he should not be employed.

Expressing this theoretically, the firm will hire workers up to the point where the marginal cost of labour is equal to the marginal revenue product of labour. If the marginal cost is higher than marginal revenue product, for instance

at OC in Figure 6, the firm will make a loss on the output produced by the marginal worker and hence it will cut back on employment of labour.

FIGURE 4

**Inelastic supply of labour**

With inelastic supply of labour, an increase in demand for labour from  $D_1$  to  $D_2$  leads to a large percentage increase of EF in wage rates but only a small percentage increase in employment of AB.

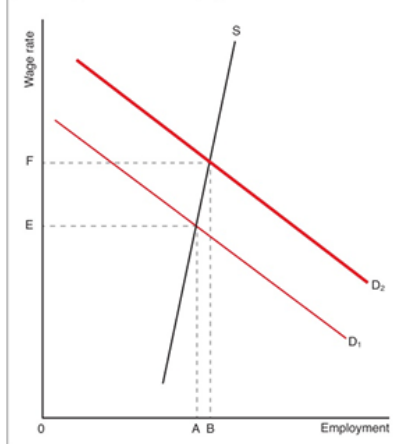


FIGURE 5

**Inelastic demand for labour**

With inelastic demand for labour, an increase in supply of labour from  $S_1$  to  $S_2$  leads to a large percentage fall of EF in wage rates but only a small percentage increase in employment of AB.

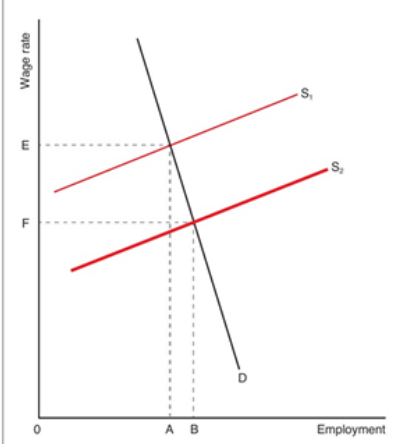
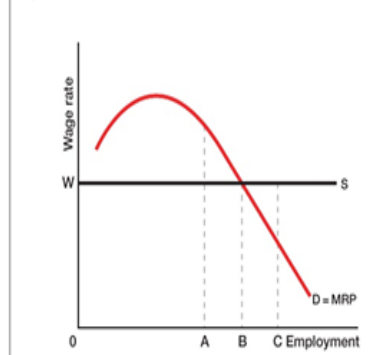


FIGURE 6

**Equilibrium employment and wage rates for a firm in a perfectly competitive factor market**

In a perfectly competitive factor market, the supply curve for labour facing the firm is horizontal. The equilibrium wage rate, OW, is set by the industry as a whole. The firm will then employ OB workers in equilibrium.



## NON-COMPETITIVE LABOUR MARKETS

A non-competitive labour market is one where:

- the firm is a dominant or monopoly buyer of labour and is therefore a monopsonist, which is often the public sector or state-owned enterprise, but where there are many individual workers
- the firm is faced with a monopoly supplier of labour, which is most likely to be a trade union
- a firm is a monopoly buyer of labour and is faced with a monopoly supplier of labour. Each of these three types of imperfectly competitive labour market will now be considered.

## WAGE SETTLEMENTS IN THE PUBLIC SECTOR/STATE-OWNED ENTERPRISES (A MONOPOLY BUYER OF LABOUR)

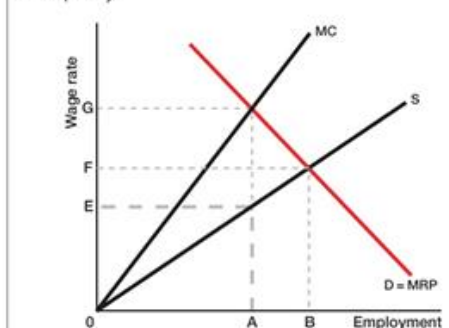
If a firm is the sole buyer of labour, it is called a monopsonist. In the public sector or state-owned enterprises the government or state employs most, if not all, the workers in that industry or occupation.

The marginal cost of employing an extra unit of labor is higher for a monopsonist than the average wage, as the firm must raise wage rates to attract additional workers. This means the cost of employing an extra worker is not just the higher wage paid to that unit but also to all other workers in the industry.

FIGURE 7

**Monopsony in the labour market**

A monopsonist will hire labour to the point where  $MC = MRP$  (i.e. up to the point OA). It will then pay labour the lowest wage rate possible, which is OE. If the industry had been perfectly competitive then both the equilibrium wage rate OF and the equilibrium level of employment OB would be higher than under monopsony.



## A MONOPOLY SELLER OF LABOUR- TRADE UNIONS

A trade union is a collective bargaining organization for workers, addressing wage and employment issues. Workers are often in a weaker bargaining position compared to their employers, as they have more knowledge and are less likely to lose their jobs. They elect representatives to negotiate on their behalf.

Trade unions aim to increase wages for their members by setting a minimum price for labor supply, creating a kinked supply curve. A union agreement raises wages from the free market wage to the unionised wage rate, preventing employers from hiring workers below a wage rate. However, this does not prevent employers from paying higher wages than the negotiated wage. Neo-classical micro-economic theory suggests that trade unions increase wages but also cause unemployment in the industry.

## BILATERAL MONOPOLY

Trade unions operate in factor markets with monopsony employers, where a trade union sells labor and a monopsonist buys it. This **bilateral monopoly** increases wages and employment compared to a factor market with a monopsony employer. The trade union forces the wage rate up to OF, creating a kinked supply curve. The monopsonist cannot pay a wage rate lower than OF due to its union agreement. However, it can pay higher wage rates to employ more than OB workers, causing a kink in the marginal cost of labor. The monopsonist has a profit incentive to hire extra workers as long as the marginal revenue product of labor is greater than the marginal cost of labor.

### SUBJECT VOCABULARY

**bilateral monopoly** when a single buyer faces a single seller in a market; in a labour market, this is most likely to occur when government is the single buyer of a type of labour and the workforce is unionised, so that the trade union acts as a single seller

**net benefits** as well as the wage rate, the supply of labour is influenced by non-monetary benefits or drawbacks, such as changes in working conditions, job security, holiday entitlement, promotion prospects, and other effects of working in a particular job or occupation

FIGURE 8

### Trade unions in a competitive market

The entry of a trade union to a competitive factor market is likely to 'kink' the supply curve of labour. OB is the union-negotiated wage rate in an industry. Employment will fall from OF to OE while wage rates will rise from OA to OB. At a wage of OB, there is now EG unemployment.

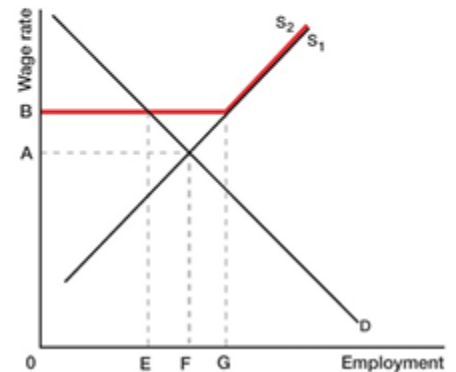
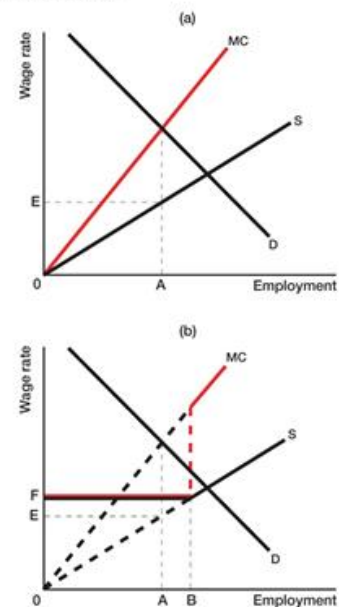


FIGURE 9

### Trade union vs a monopsonist employer

A monopsonist facing a large number of employees in an industry will force wage rates down to OE and restrict employment to OA. The entry of a trade union to the industry which sets a minimum wage of OF will 'kink' the supply curve of labour and cause a gap in the marginal cost curve for labour. The monopsonist has a profit incentive to hire extra workers so long as the marginal revenue product of labour, shown by the demand curve, is greater than the marginal cost of labour. Hence it will employ OB workers.



## Chapter 18 -Market failure in the labour market

### THE MOBILITY OF LABOUR

In a perfect labour market, there are no barriers to the supply of labour to any region or any occupation. Workers can move freely from one job to another in different regions and in different occupations.

There are two types of immobility of labour as outlined below:

- Geographical immobility of labour
- Occupational immobility of labour.

### CAUSES OF GEOGRAPHICAL IMMOBILITY OF LABOUR

**Geographical immobility** is a challenge faced by workers when they cannot move between areas, regions, or countries due to various factors. These include search costs, lack of awareness of job opportunities, and strong roots in their local communities. Housing also plays a significant role in geographical immobility, as renters may struggle to find suitable housing in areas with job vacancies. Additionally, legal restrictions, language barriers, and qualifications recognition in other countries can also hinder mobility. Lower income individuals often face greater barriers to mobility.

### CONSEQUENCES OF GEOGRAPHICAL IMMOBILITY OF LABOUR

Geographical immobility of labour leads to wage differences, with higher wages in areas with unfilled job vacancies and lower wages in areas of high unemployment. This leads to workers being attracted to areas with higher wages, reducing the problem and workers leaving areas with lower wages. However, the immobility of labour prevents market signals from working, leading to market failure. Increased house prices also worsen geographical immobility, making it harder for firms to expand or fulfill contracts, resulting in lower output. **Structural unemployment**, caused by industries closing in previously concentrated areas, wastes economic resources and leads to higher government support and lower tax revenue.

### CAUSES OF OCCUPATIONAL IMMOBILITY OF LABOUR

Occupational immobility refers to the difficulty in transferring workers from one occupation to another due to specific knowledge, skills, and qualifications required for different jobs. Short-term difficulties include lack of natural talent, time and money required for education and training, and a lack of knowledge about education and training opportunities. In the long term, it becomes more possible, but the cost may be high, making it difficult to change occupations.

### CONSEQUENCES OF OCCUPATIONAL IMMOBILITY OF LABOUR

Occupational immobility leads to similar consequences as geographical immobility, including unfilled job vacancies, lower economic output, and market failure. Unemployment is higher in certain occupations, as those without the necessary skills may remain unemployed for extended periods unless they retrain or take lower-skilled jobs, resulting in underemployment.

#### SUBJECT VOCABULARY

geographical immobility when workers find it difficult to move from one area to another

occupational immobility when workers find it difficult to transfer from one occupation to another

structural unemployment when the pattern of demand and production changes, leaving workers unemployed in labour markets where demand has shrunk