

# Economics

James Campbell

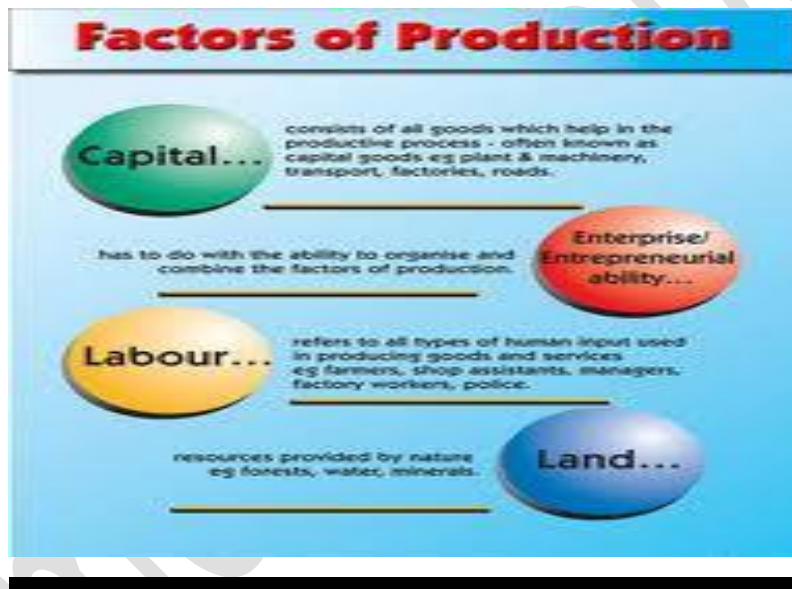
Higher Level

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## *The factors of Production*



# The Factors Of Production



## Factors of Production

**Factors of Production** are defined as those resources or inputs which contribute to economic activity.

Factor	Definition	Payment
Land	Anything supplied by nature which helps to produce wealth.	Economic Rent
Labour	Human activity directed towards the production of wealth.	Wages
Capital	Anything made by man which helps in the production of wealth.	Interest
Enterprise	Human activity – the risk and initiative in setting up a firm.	Profit

**Important Terms:** 1) Derived Demand 2) Specific Factors of Production 3) Non-Specific Factors of Production 4) Mobility of A Factor of Production 5) Occupational Mobility 6) Geographical Mobility 7) Supply Price of a Factor of Production 8) Transfer Earnings 9) Economic Rent 10) Quasi Rent

Demand for the factors of production is a **Derived Demand**  $\Rightarrow$  they are demanded because of the contribution which they make to economic activity.

E.g. builders purchase concrete blocks not because they consider them to be beautiful but only because they require them to build houses.

**Specific Factors of Production** are factors of production of a specialised nature – they cannot be easily adapted to other uses, e.g. mountain land which has no use other than for sheep grazing.

**Non – Specific Factors of Production** are factors of production which can be relatively easily transferred to other uses, e.g. farmland can be transferred from the growing of different crops to use as pastureland.

**Mobility of A Factor Of Production** refers to the ease with which a factor of

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production can be transferred from one use to another.

**Occupational Mobility** refers to the ease with which a factor of production can move from one occupation to another, e.g. from labourers to doctors, from clerks to teachers.

**Geographical Mobility** refers to the ease with which factors of production can move from one area or country to another. Workers within the EU are free to move between the different member countries.

**The Supply Price of A Factor Of Production** is the minimum payment required in order to bring it into existence for a particular purpose and maintain it in its present value.

E.g. If I wish to employ a carpenter I must pay him a wage rate which will result in him agreeing to work for me. The supply price of this factor of production to me is what I must pay him to offer his services to me. Having got him to work for me I must him at a rate which will discourage him from going to a different employer. The wage he can get in his next most rewarding employment is his **transfer earnings**. If the best wages which my carpenter can get elsewhere are €80 per week then his transfer earnings are €80 per week.

The supply price is the minimum payment which must be paid in order to acquire the services of a factor of production. Therefore any payment above the supply price of a factor is known as **economic rent**  $\Rightarrow$  the amount by which a payment to a factor of production exceeds its supply price.

If a carpenter is paid €80 per week and his supply price is €77, €3 is an economic rent.

**Quasi-Rent** is the term applied to rent payments of a temporary nature.

If there is a shortage of plumbers the demand for plumbers will increase the earnings of existing plumbers. They will continue to earn a quasi-rent until such time as the supply of plumbers is increased through an increase in apprenticeships and eventually wages return to their normal level.

## Demand for A Factor Of Production

Demand for factors is a **derived demand**  $\Rightarrow$  demanded because they help in the attainment of some overall objective  $\rightarrow$  maximisation of profits.

The amount of a particular factor which is used is determined by the contribution which that factor makes to the business and the price that has to be paid for the factor.

Therefore, it is the contribution that the last unit of a particular factor makes to total output  $\Rightarrow$  the factor's **Marginal Physical Productivity (MPP)**

**MPP  $\Rightarrow$  the addition to output caused by hiring an extra unit of a factor of production.**

Labour	Total Output	MPP
1	1000	
2	1400	400
3	1700	300
4	1900	200
5	2000	100

The contribution to output of 5 units of labour is 2000 units but the fifth man contributes only 100 units.

Therefore, it makes more sense to talk about a factor's **Marginal Revenue Productivity (MRP)**



**MRP  $\Rightarrow$  the addition to revenue caused by hiring an extra unit of a factor**

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### of production.

Labour Units	Total Revenue (€)	MRP (€)
1	5,000	
2	10,000	5000
3	15,000	5000
4	18,000	3000
5	20,000	2000

TR from 5 units of labour is €20,000 per annum but the fifth unit only contributes €2000 per annum.

**The Law of Diminishing Returns** applies to MRP and MPP  $\Rightarrow$  the addition to revenue or output caused by the last unit of a factor declines eventually  $\Rightarrow$  as more variable factors are added to a fixed factor the marginal returns begin to diminish.

### **MRP and the Demand for Labour**

The MRP curve slopes downwards due to the Law of Diminishing Marginal Returns.

The MRP curve also serves as the firm's demand curve for labour.

No. Of Men Employed	MRP
10	35
11	34
12	33
13	32
14	31
15	30

The MRP of the tenth man is €35. Therefore, the highest price which an employer would be prepared to pay in wages to that man would be €35. If he paid him in excess of this he would lose money through employing him.

The MRP of the 11<sup>th</sup> man is €34. Therefore, the maximum wage offered to the 11<sup>th</sup> man is €34.

Therefore, the MRP of a factor of production determines the maximum price which will be paid for the services of the factor and the MRP of a factor of production is also its demand curve. A firm employs every person up to and

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including that person whose wage rate and marginal revenue product are equal.

MRP is difficult to ascertain. How can one rate the contribution to the revenue of a school of each teacher or that of a surgeon to a hospital?

### **Under Perfect Competition $MRP = MPP \times Price$**

MPP Of Labour

MRP of Labour

No Of Men Employed	Total Output In Units	MPP	Selling Price	Total Revenue	MRP
10	110		1	110	
11	124	14	1	124	14
12	140	16	1	140	16
13	155	15	1	155	15
14	166	11	1	166	11
15	175	9	1	175	9

Under Perfect Competition each unit sells for €1. The MRP curve of the firm is identical with the firm's MPP and the slope of these curves will be the same under Perfect Competition because the firm can sell its extra output at a constant selling price.

### **In Perfect Competition $MRP = MPP \times Price$**

**Under Conditions of Imperfect Competition and Monopoly MRP is not equal to MPP x Price.**

Number of Men Employed	Total Output in Units	MPP	Selling Price	Total Revenue	MRP
10	100		10	1000	
11	130	30	9.5	1235	235
12	155	25	9.0	1395	160

The MPP of the 11<sup>th</sup> man is 30 units and even though each of these units is sold at €9.5 MRP is not  $30 \times €9.5$  because the 100 original units which were being sold for €10 must now be sold for €9.5 each.

Therefore, the MPP for the 12<sup>th</sup> man is 25 units and MRP is €160 and not  $25 \times €9.0$ .

**Where a firm faces a downward sloping demand curve for its goods MRP is not equal to MPP x Price.**

The MRP curve of a monopolist or imperfectly competitive firm slopes downwards because

- 1) **The Law of Diminishing Marginal Returns** – as extra units of a variable factor are added to a fixed quantity of another factor, the returns per unit to the variable factor eventually begin to diminish. As more workers are employed, both their MRP and MPP begin to decline.
- 2) **A downward sloping demand curve** – price has to be lowered to increase demand and so sell a greater output. The revenue earned from each extra unit of output falls. So, the MRP of extra units of labour declines.



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# **The Factor Of Production LABOUR**



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## The Factor of Production Labour

**The factor Labour is defined as any human activity directed towards the production of wealth. The payment to Labour is Wages.**

**Nominal wages** are the money wages paid to labour in a given period of time.  
**Real wages** are nominal wages, adjusted to take into account changes in the price level.

Given that most workers expect at least to maintain their real wages, an annual increase in money wages to reflect price increases, is usually expected, hence, money wage settlements tend to be indexed to inflation.

**Like any payment the payment to Labour is determined by supply and demand. The demand curve for labour and any factor of production is its MRP curve.**

The 50<sup>th</sup> worker contributes €10 to the revenue of the business. If the wage rate is €10 per week 50 workers will be employed as every worker is demanded up to and including that worker whose MRP and wage rate are equal.

**Therefore, the demand curve for labour is its MRP curve.**

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**The Supply of Labour** is determined by 1) the size of population, 2) the participation rate and 3) the number of hours people work.

Rewards based on financial incentives are called pecuniary rewards and those not based on financial rewards are called non-pecuniary rewards.

## 1) The Size of Population

The greater the population the greater the workforce available. Population of India is 1.37b while the population of Ireland is 4.9m so India will have a greater workforce available compared to Ireland.

## 2) The Participation Rate ⇒ Those who are able and willing to work

## 3) The Number of Hours People Work ⇒ Do they work a 35-hour week or a 40-hour week?

### The Participation Rate depends on

- a) Social Conventions i.e. the age of retirement and period of compulsory schooling. The lower the age of retirement and the higher the school leaving age the lower the participation rate.
- b) Whether or not married women work outside the home.
- c) Welfare provision for aged and sick; the better these provisions the less likely are these people to seek work.
- d) State of the economy – when the economy is buoyant people who might not have sought work seek it – older people and married women.

The **choice between work and leisure** itself can be **affected by many factors**, including:

- i. Age** – older workers often gain more utility from leisure.
- ii. Direct taxes** – higher income tax rates may increase the utility of leisure and reduce the supply of labour.
- iii. Dependants** – having children may increase the utility of work and increase the supply of labour.
- iv. Non-work income** – some individuals can retire from the labour market because they have company pensions which are usually paid before state pensions. Non-work income can come in the form of cash benefits, such as the Job Seeker's Allowance and benefits-in-kind, such as subsidised travel cards.

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v. **The level of non-pecuniary rewards**, including job satisfaction, and employment status.

## The Demand for labour is determined by:

- ✓ The **MRP** of labour.
- ✓ The **wage rate** – if wages rise, the demand for labour falls, if wages fall, the demand for labour rises.
- ✓ The **demand for the output of goods and services** produced by the firm – if demand is high there will be a high demand for labour.
- ✓ **Increased automation/mechanisation** of the production process – if the production process is capital intensive, demand for labour will fall.
- ✓ **Subsidies for employment**: if subsidies are available to employ workers then the demand for workers may increase.
- ✓ **Employers PRSI**: if the cost of employing workers is high, demand for workers will fall.
- ✓ **The state of the economy** - a vibrant economy increases the demand for labour.
- ✓ **The level of skill** in the workforce.
- ✓ The **cost of training** workers

## The Supply Curve of Labour

Upward sloping from left to right – as wages rise, supply of labour rises, as wages fall, supply of labour fall.

## The Backward Bending Supply Curve of Labour

It is possible that as people earn higher incomes they may desire more leisure and less work e.g. if a carpenter earning €70 per week gets an increase to €90 per week he may be less inclined to work overtime.

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Also a person who pays a high marginal rate of taxation may consider that after the sum which he receives for working overtime is not worth the effort and inconvenience involved; a married woman who works 10 hours per week @ €1 per hour to increase the family income may if the hourly rate is increased to €2 per hour work less than ten hours, say seven hours per week. Her money income has been increased by €4 (€10 to €14) and she has three hours per week for other activities.

For workers who have a second job they may give up the second if income in their main employment increases.

In all these cases there is a substitution effect – workers substitute leisure for work.

At W1 quantity of labour supplied was Q1. As wages increase to W2 quantity of labour supplied increase to Q2. As wages increase to W3 quantity of labour supplied falls to Q3.

**A Backward Bending Supply Curve indicates that at higher wages less labour is being supplied but only at the higher wage.**

**The Equilibrium Wage Rate**

Equilibrium Wage Rate is  $W$ , level of employment is  $H$

If the wage rate was  $W_1$  the excess supply of labour would force the wage rate downwards.

If the wage rate was  $W_2$ , the excess demand for labour would force the wage rate upwards to equilibrium.

**Trade Unions and The Supply of Labour**

- 1) Wages are determined by the interaction of the buyer (employer) and the seller (trade union)
- 2) The trade union acts as a monopolist – the sole supplier of a particular skill at particular wage rates.

The trade union will decide the price to be charged. (A monopolist can decide the quantity to be sold or the price to be charged.)

Where there is only one buyer and one seller of a particular type of labour  
⇒ Bilateral Monopoly.

- 3) When a union negotiates a wage rate for its members no supply of is available at wage rates below the negotiated rate ⇒ the supply curve of labour is horizontal over a large range of levels of employment.

$W_1$  is the equilibrium wage rate before a trade union is formed and the quantity of labour employed would be  $L_1$ .

4 (b)

$W_x$  is the negotiated wage rate after the union is formed. No labour will be supplied below this level.

- 5) The supply curve may begin to rise if the demand for labour is greater than the supply which is forthcoming at the negotiated wage – wage drift develops.

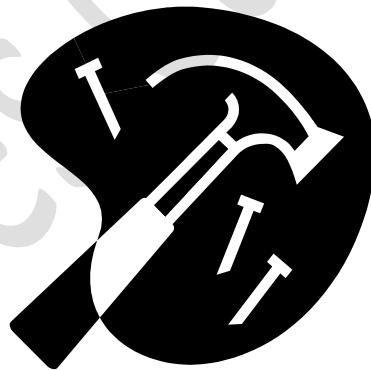
The demand curve for labour shifts upwards from  $D_1$  to  $D_2$  when demand for labour increase. Wage levels increase from  $W_x$  to  $W_z$  which may equal the new minimum wage.

### Setting Wages in A Market Where Trade Unions Exist

- 1) Setting a minimum wage – Trade Unions strive to safeguard the jobs of their members. They may set a minimum wage for a particular occupation, below which no labour will be supplied. It can only achieve this if it enjoys a monopoly in the supply of labour for that job.

- 2) **A restriction on the Supply of Labour** – a union may attempt to restrict the supply of labour to an occupation in an effort to keep wages high. The union is controlling the quantity and the market is setting the price. Methods used to restrict the supply of labour include a) lengthy and costly training periods, b) restricted openings for trainees, c) difficult exams.
- 3) **Trade Unions Unwilling to Accept Wage Reductions** – Wages generally increase especially if there is an economic boom and the demand for labour is high. However, during a recession when demand for labour falls, unions may be unwilling to accept a cut in wages. Unemployment may follow.
- 4) **Government Restriction on Wages** – To help control inflation the government may impose a wage freeze for a period of time. If demand for labour is high employers will compete against each other by offering overtime, special bonuses and commissions to retain their workers and to attract the best workers.

**Wage Drift** – if demand for labour is strong the wage rate may rise above the rate negotiated by unions and employers.





**Why Do Some Workers in Some Jobs Earn More Than Those in Other Jobs?**



- 1) **Differences in Productivity**  $\Rightarrow$  Some workers are more productive than other workers. The MRP of labour is the addition to the total revenue of a firm due to employing that extra worker. However, it would be impossible to pay a worker according to his/her MRP even though it would make economic sense. **Sales people** are often paid according to their MRP in the form of commission.
- 2) **Natural/innate talents**  $\Rightarrow$  innate talents allow workers to earn an income many times greater than the average earnings e.g. football players, actors etc
- 3) **Tradition and views of the public**  $\Rightarrow$  traditionally some jobs are highly paid while others are poorly paid, e.g. doctors are highly paid because of value the economy places on that job.
- 4) **Length of training and cost**  $\Rightarrow$  occupations that require lengthy and costly periods of training will demand higher wages e.g. medical doctors
- 5) **Education**  $\Rightarrow$  some jobs require a high standard of education e.g. jobs/occupations which require master's degrees will command higher salaries than those that do not require such qualifications.
- 6) **Monetary benefits other than pay**  $\Rightarrow$  perks or benefits in kind are often paid instead of high wages, e.g. low interest rates on loans for bank employees, company cars.
- 7) **Non-Monetary Benefits**  $\Rightarrow$  some workers may accept lower incomes in favour of non-monetary benefits e.g. Airline staff have the opportunity to travel.
- 8) **Working Conditions**  $\Rightarrow$  some jobs may be difficult or unpleasant and may enjoy higher incomes as a result, e.g. oil rig workers, undertakers, night shift workers.
- 9) **The Nature of The Job**  $\Rightarrow$  whether the job is permanent or temporary affects the wage rate.
- 10) **Different wage rates for private and public sector workers**  $\Rightarrow$  in the past public service employment offered job security. This combined with a state pension was seen to justify lower wages than in the private sector.

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However, jobs are no longer safe due to more fixed term contracts in the public sector. The Benchmarking Body has set out to compare levels of pay within the public and private sectors.

- 11) Different wage rates for males and females – women still earn less than men in most sectors of the economy.

## Types of Unemployment

1) Frictional Unemployment – unavoidable – occurs even when the economy is doing well. It occurs when a) people are unemployed between jobs or b) the skills of the unemployed do not match the skills required in the jobs that are available. Many IT companies are currently finding it difficult to recruit skilled IT workers.

2) Seasonal Unemployment – demand for workers increases during the summer time and then slackens off during the winter e.g. tourism, agriculture and building industry.

3) Structural Unemployment – 2 types

a) Changes in Pattern of Demand in the Economy



Industries that once were major employers have gone into decline e.g. shipbuilding, coal mining, iron and steel industry. Coal has been replaced by oil and gas and they in turn will be replaced by renewables. When the British coal mines closed, thousands of miners lost their jobs.

b) The Introduction of Technology

Computers, assembly lines and machinery have reduced the need for workers.

Structural unemployment may lead to a relocation of workers or retraining.

4) Institutional Unemployment – unemployment due to obstacles to the mobility of labour or the removal of the incentive to work – e.g. a shortage of housing in an area – a “closed shop” in a factory – immigration barriers – little difference between unemployment benefit and take-home pay.

5) Cyclical Unemployment – unemployment that results when the overall demand for goods and services in an economy cannot support full employment. It occurs when there is slow economic growth.

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**Underemployment:** A worker, even though he/she is employed, is not operating at full capacity i.e. his/her output is less than what it could be.

**The Quarterly National Household Survey:** used by the Central Statistics Office to measure unemployment.

**Live Register:** a list of those under 65 years of age who are claiming job-seekers benefit or job-seekers allowance.

## **Mobility of Labour**

### **Occupational & Geographical Mobility**



**Occupational Mobility**  $\Rightarrow$  the ease of movement of workers from one job to another

#### **Barriers to Occupational Mobility:**

- 1) High training costs and levels of education:** high apprenticeship costs and expensive educational courses may act as a barrier to workers entering a trade/profession which they may be suited to.
- 2) Specialisation of labour:** the more skilled a worker is the harder it may be for that highly skilled worker to find alternative employment.
- 3) Professional associations and trade unions:** these two groups may make entry into certain occupations/jobs difficult in order to limit competition for jobs and so maintain a high level of salaries and fees.
- 4) Trade Unions and Closed Shops ( a place of work where all employees must belong to an agreed trade union)**

**Geographical Mobility** ⇒ the ease of moving from one area to another.

**Barriers to Geographical Mobility:**

- 1) **Cost & inconvenience** of moving
- 2) **Lack of awareness** of alternative work/jobs being available.
- 3) **Language and cultural barriers**
- 4) **Lack of a proper social infrastructure** e.g. housing
- 5) **Non-monetary considerations** – unwillingness to disturb children's education
- 6) **Government actions and policies** regarding immigration requirements, work permits etc

The greater the mobility of labour, the lower the level of unemployment.

**State and explain four factors that influence the efficiency of labour as a factor of production:**

**Education, training, qualifications** – the more educated workers are more productive than those who have no qualifications.

**Natural talent:** natural talents allow some workers to be more efficient than others.

**Commitment:** those workers who are more committed will work much more efficiently.

**Degree of specialization:** the more specialized the worker is, the more efficient he/she will be.

**Living conditions/Environment:** healthy workers living and working in good surroundings will be more efficient than those coming from a poor environment.

**Climate:** Too hot or too cold a climate may influence the efficiency of workers.

**Quality of the factors of production:** the better the quality the more productive the worker will be.

## Specialisation/Division of Labour

In the 21<sup>st</sup> century workers work in narrowly defined occupations – workers become specialised in a particular task – teachers, lawyers, doctors, police officers etc. Specialisation increases the amount of wealth in an economy.

### Why does specialization increase productivity:

**1) Skill & dexterity:** when working on a single specialized task the worker becomes skilled in performing that task and overtime performs it more rapidly and with less effort. Production increases.

**2) Use of machinery:** specialization splits the production process into separate tasks enabling a person to give all their time and attention to one job. The worker produces a much larger output than if he/she tried to perform each step in the production process. Machinery can only be used economically if it is fully utilized and producing large outputs.

**3) Innate talents/skills:** specialization allows workers to find a job which is suitable to their own talents. If a person works in a sector suited to his/her talents productivity will increase and the worker will be more content.

**4) Time saving:** When workers specialize there is no loss of time in moving from job to another.

### Disadvantages of Specialisation:

**1) Increased dependency:** Specialised workers will be dependent on many other workers for goods and services that they require. An Irish nurse may be able to nurse her patients to a very high standard but she is dependent on middle eastern countries for oil to heat her home and on European farmers to produce the food that she requires.

**2) Unemployment risk:** A highly specialised worker may find it very difficult to find alternative employment if he/she becomes unemployed. A mechanic in a garage may discover that his skills are of little relevance to most of the jobs outside the garage.

**3) Personality impacts:** Performing the same task every day reduces opportunity for mental stimulus or for using one's own initiative. Work may become boring.

Q3A 2010

(a) With reference to the factor of production **labour**, explain the following terms:

- ☐ Derived Demand;
- ☐ Marginal Revenue Productivity;
- ☐ Wage Drift;
- ☐ Cyclical Unemployment.

(20

marks)

(b) (i) State and explain **four** factors which influence the efficiency of labour as a factor of production.

*Recently the Organisation for Economic Cooperation and Development (OECD)*

*recommended that lower wages are necessary to restore stability to the Irish economy and that consideration should be given to reducing the National Minimum Wage over time.*

(ii) Outline **one** possible economic advantage and **one** possible economic disadvantage, to the Irish economy, of reducing the National Minimum Wage.

(30 marks)

(c) Ireland's 'Black Economy' (underground economy) activity results in a loss of up to €6.1bn to the Exchequer annually, according to the economist Friedrich Schneider.

(i) State and explain **three** economic effects of this activity in Ireland.

(ii) Outline **two** economic measures the Irish Government could take to discourage this activity.

(25 marks)

[75 marks]

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4. (a) Define **each** of the following:

(i) Supply price of a factor of production.

(ii) Transfer earnings.

(iii) Economic Rent.

(20 marks)

(b) A principal factor influencing the demand for labour by an individual firm is the **Marginal Revenue Productivity of Labour** (MRP).

(i) Explain what is meant by the underlined term.

(ii) Discuss the factors, other than MRP, which influence the demand for labour by an individual firm.

(30 marks)

(c) The diagram below represents the supply curve of labour to a particular firm.

€ Supply Curve

Wage rate

Supply of Labour

Explain the effect which each of the following developments may have on this supply curve.

Illustrate each answer by means of a diagram.

(i) The workers shift their preference towards increased leisure time.

(ii) The workers' trade union negotiates a minimum wage.

(25 marks)

[75 marks]

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## Q3 2007

(a) The demand for labour as a factor of production is a **derived demand** and is affected by that factor's **Marginal Revenue Productivity** (MRP).

(i) Explain each of the underlined terms.

(ii) Outline **TWO** developments, other than a fall in MRP, which may result in a firm **reducing** its number of employees. (20 marks)

(b) (i) State and explain **THREE** factors which are currently affecting the **supply** of labour to the Irish economy

(ii) The demand for labour has increased significantly in certain sectors of the Irish economy in recent years, e.g. construction.

Discuss **THREE** economic consequences of this situation. (30 marks)

(c) 'At a time of full (or near full) employment in the Irish economy, it is important that there should be the maximum **occupational mobility** and **geographical mobility** of labour.'

(i) Distinguish between the two underlined terms.

(ii) Outline **THREE** economic policies which could increase **either** occupational mobility of labour **or** geographical mobility of labour, in Ireland. (25 marks)

[75 marks]



# The Factors Of Production

