6   Factor Market

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Unit 1 : Demand for Factors - the traditional analysis

I   Nature of Factors and the Factor Market
The demand for a factor input is a **derived** demand. The producers need factor inputs to produce any goods and services so that production derives the demand for factor inputs.
In a simplified way, the factor of production - **labour** is used to illustrate the nature of factor demand.

II   Labour Market
The firm is on the demand side and the labour (also being the consumer) is on the supply side.
To the producer, the wage rate is treated as the **price** of labour.

Assumptions :
* Workers are perfectly mobile and divisible.
* Both labour and firm are price-takers or wage-takers, i.e. they are not in a position to affect the market wage rate.
* The product market is a price-taking market in equilibrium, i.e. equilibrium price exists.
* Labour is homogeneous, i.e. equally skillful so that there is perfect substitution on labour.
* In the short run, labour is the **only** variable factor of production.

Marginal Factor Cost (MFC)
If labour is the only variable factor, then it implies that the marginal cost of a firm is in fact the marginal cost spent on employing a unit of labour (hour), together with a certain amount of fixed inputs in the short run, to produce a certain amount of output.

Value of Marginal Product (VMP) of Labour
A firm is always interested in how much its revenue could be increased by hiring a unit of labour. By the extra revenue earned as a result, the firm could determine whether that unit of labour is worth hiring or not. More labour means more outputs or a change in its marginal product.
From the view of the firm, the importance of a labour is its marginal product contributed to the firm through production. To put it more precisely, a firm concerns about the *value* of the marginal product of any unit of labour.
Here the word *value* refers to the market value of the product, i.e. the market price of the product. Therefore,

$$\text{VMP = Price of product } \times \text{ Marginal Product = P } \times \text{ MP.}$$

Marginal Revenue Product (MRP)
However in a price-searcher market, the price-searcher must take account of the fact that in order to sell an extra unit of output, it must reduce the price on **all** units sold. If the monopolist wants to find out the change in total revenue that results from an increase in the use of a variable factor, say, L , *the monopolist must look at the change in output due to an extra unit of labour and the marginal revenue resulting from the sale of that extra unit of output.*
Thus, the increase in total revenue due to a one-unit increase in the variable input is given by :

$$\text{Marginal Revenue Product} \equiv \text{MR } \times \text{MP}$$

An Example

Given :   Price of final goods = $20 / unit ; &   Wage rate = $60 / hour.

| Working Hours	Total Product	Marginal Product	MRP of Labour	Average Product	Average Revenue Product (ARP = AR x AP)
1	5	5		5	
2	12	7			
3	20			6.67	
4	26				
5	30				
6	33				
7	35				
8	36				

In the product market the firm maximizes its wealth by producing at an output level where its MR = MC.
Similarly in the factor market, the firm maximizes by hiring any factor (labour here) up to the point at which the extra revenue to be obtained from hiring one more unit of the factor (i.e. MRP) equals to the cost of hiring (i.e. MFC) it.

Thus in deciding to hire a certain unit of labour or not, a firm had to be sure that the value of the marginal product produced by that unit of labour (VMP or MRP) is greater than or equal to the cost of hiring that unit of labour (i.e. the wage rate).

In case of a price-taking firm with labour as the only variable factor, the MFC is the amount of wage rate (determined by the demand and supply of the factor market) faced by the firm.

In equilibrium : $\quad\quad$ **M F C (Wage Rate) = M R P (of labour) = V M P**

The Labour Market $\quad\quad\quad\quad\quad\quad\quad$ **An Individual Firm**
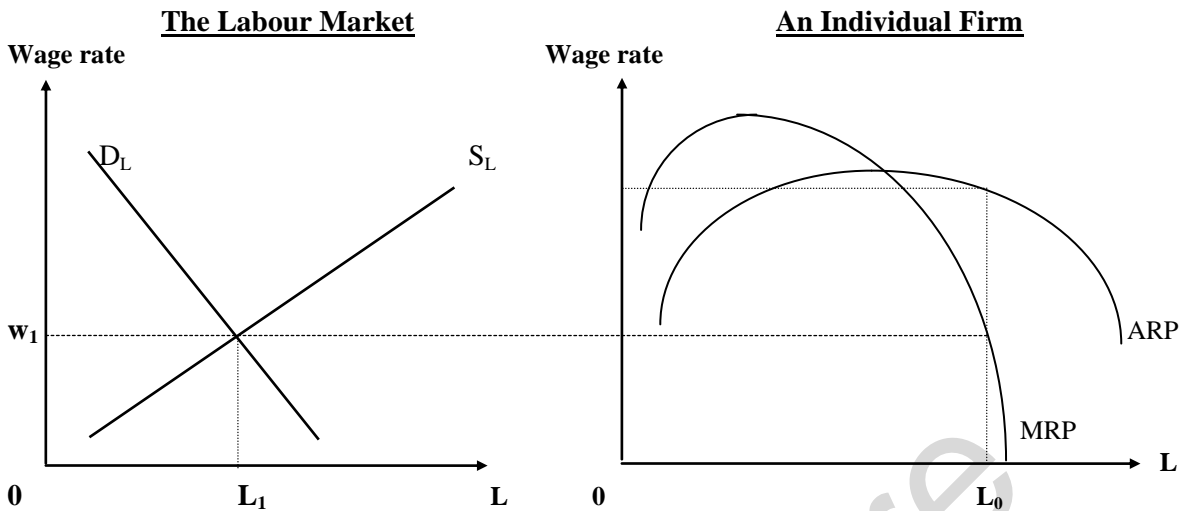

The price-taking firm, faced with an equilibrium wage rate of w_1 determined in the labour market, had to decide how much labour to hire. By equating MFC or wage rate with MRP, the firm decides to hire L_0 units of labour.

Total Revenue = Price x Quantity = P x (Q/L) x L = P x AP x L $\quad\quad$ where P = AR
Total Revenue = AR x AP x L = ARP x L = Area under the ARP curve.

Total Variable Cost = Wage Rate x Labour Hours. $\quad\quad\quad$ (Total Cost = TFC + TVC)

If the difference between TR and TVC is greater than the amount of TFC, the firm is enjoying a gain in wealth in the short run.

III $\quad$ The Demand Curve For A Factor (Labour) In The Short Run

The Labour Market $\quad\quad\quad\quad\quad\quad\quad$ **An Individual Firm**
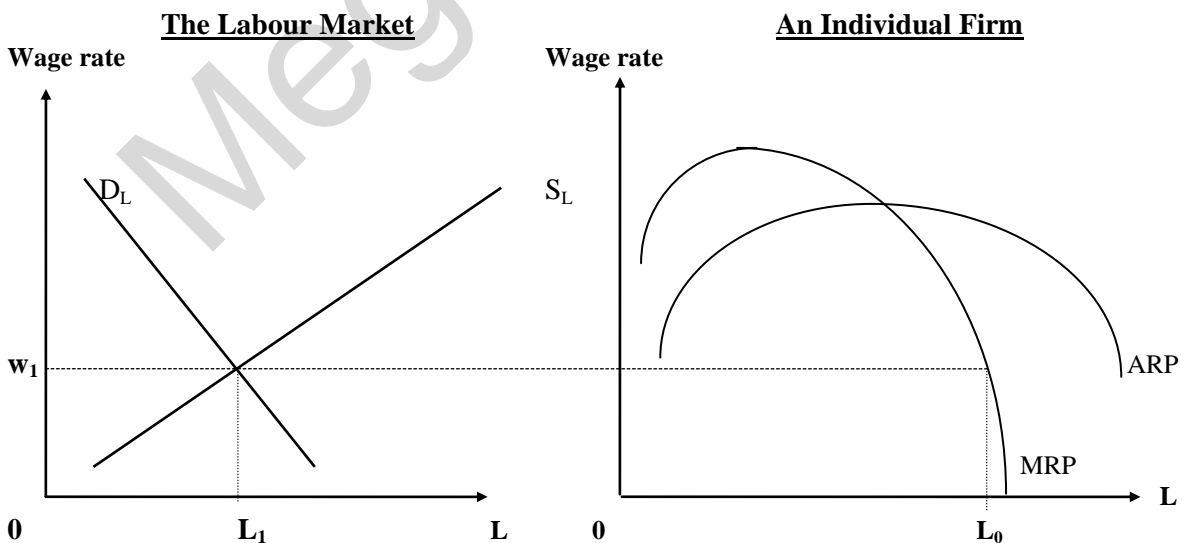
The demand curve for a variable factor (labour) can be derived by the above diagrams.

The demand curve for a variable factor of a price-taking firm is its MRP curve starting from the maximum point of its ARP curve.

IV   <u>Factors Affecting The Shift of The Factor Demand Curve</u>

*   The price of a good sold in the product market affects the value of MRP as well as the final equilibrium point between MFC and MRP.
*   The change of the MP curve also depends on :
  - the level of technology used in production ;
  - the degree of diminishing returns which partly depends on the amount of fixed factors used ;
  - other factors that affect technology and fixed capital, e.g. interest rate.

*   The elasticity of demand of the final product ;
*   The share of the labour cost to the total cost : the greater the share, the more elastic the demand ;
*   The ease of factor substitution : the rate of technical substitution between labour and capital.

V   <u>Supply of Factor Inputs</u>

<u>Factors Affecting the Supply of A Factor</u>
*   the degree of transfer and substitution of factors ;
*   the availability of factors in the economy.

<u>Factors Affecting the Elasticity of Supply of A Factor</u>
*   factor mobility : geographical and occupational mobility of the factors ;
*   the personal attitude towards work and leisure (to be explained in the next topic).

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