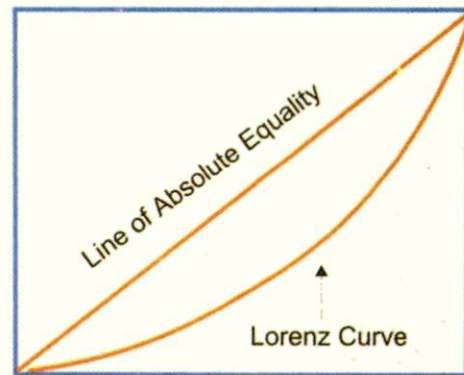
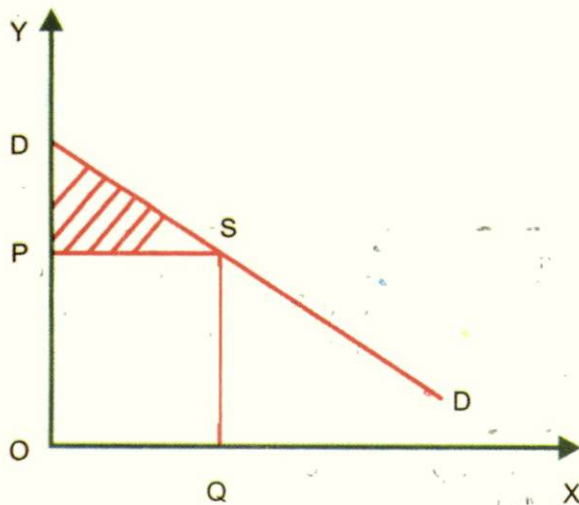
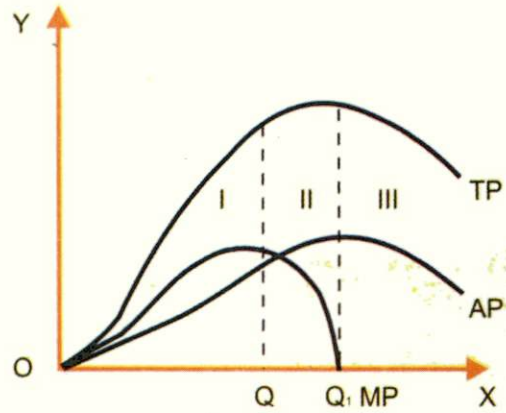
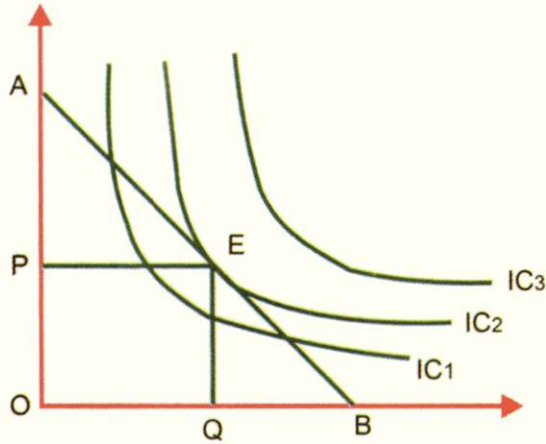




COURSE : 1

M.A. (PREVIOUS)
MICRO-ECONOMIC ANALYSIS



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ಡಾ. ಕುಳಂದೈಸ್ವಾಮಿ

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**Economics
Course I**

Block

6

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BLOCK - 6 : Block Introduction:

In block 4, you have been exposed to the determination of product prices under various market structures. In this block you will learn about how the prices of factors of production are determined. Since total output is nothing but the total value of factor earnings, you will also study the nature of distribution of output among the factors. This is called the functional distribution of income which discusses the principles governing the returns or remuneration to various factors of production.

Unlike the early economists who adopted individualistic approach to the determination of prices of each individual factors of production – Land, Labour, Capital and organization, the later economists believe that just as the price of a product, the price of a factor too is determined by its demand and supply. Therefore, the theory of distribution is essentially a theory of factor pricing.

The block is divided into three units. In the first unit (Unit No. 25) the marginal productivity theory of distribution; Euler's product exhaustion theorem; elasticity of technical substitution and technological change on factor shares will be studied. In the second unit (Unit No. 26), theories of distribution under imperfect product and factor markets; and in the third unit (Unit No. 27), few macro theories of distribution will be studied.

Unit 25: Theory of Distribution

- 25.1 Introduction
- 25.2 Objectives
- 25.3 Neo-classical Approach
- 25.4 Marginal Productivity Theory
 - 25.4.1 Demand for factors in perfectly competitive markets
 - 25.4.2 Supply of Factors of Production
 - 25.4.2.1 The supply of Inputs to a firm
 - 25.4.2.2 Market supply of factors
 - 25.4.3 Market Equilibrium
 - 25.4.4 Conclusion
- 25.5 Product Exhaustion Theorem
- 25.6 Elasticity of Technical substitution
- 25.7 Technical Progress and factor shares
- 25.8 Let us summarize

25.1 Objectives:

After Studying this unit, you should be able to:

- e) Appreciate the marginal productivity theory of factor pricing.
- f) Understand how the factor share add up to total output.
- g) How elasticity of substitution can be employed to analyze the changing factor shares; and
- h) Discuss the effect of technological change on factor shares.

25.2 Introduction

This unit introduces to you a general theory of factor - pricing. The unit also analyzes how factor – payments are the constituents of total output produced in the economy. The change in factor – use due to technological progress and the consequent impact on factor shares will also be studied.

25.3 Neo – Classical Approach

The theory of income distribution is the study of determination of the share of factors of production in the total output produced. Given the output in a given time period, the factor shares depend upon the factor prices. The early economists classified the factors as land, labour, capital and organization. They devised separate theories for determination of each of the factors of production. Hence, there was no single theory of factor pricing that is generally applicable. Later, the neo-classical economists viz, Marshall, Jevons and Wicksteed employed marginalism tools to explain a general theory known as the marginal productivity theory of factor pricing. Therefore, the neo-classical approach diverges from the earlier ones by developing a general theory applicable to all factors. In the next section, we shall be discussing the marginal productivity theory.

25.4 Marginal Productivity Theory

J.B. Clark enunciated the theory in 1899 and was perfected by Alfred Marshall, Stanley Jevons, Wicksteed and others identified with neo-classical school. That is why this is often referred to as the neo-classical approach. Mark Blaug (1968) states the principle as follows.

“In equilibrium each productive agent will be rewarded in accordance with its marginal productivity, as measured by the effect of the addition or withdrawal of a unit of that agent on the total product, the quantity of other agents being held constant.”

With profit maximization as the sole objective, the producers try to ensure that the cost of a marginal unit of a factor is equal to its contribution to output. This is a general principle applicable to all factors.

Clark's theory is based on the following assumptions:

- i) Stationary state where population, capital and technology are unchanging.
- ii) Perfect competition in the factor and product markets.
- iii) Perfect homogeneity and mobility of factors
- iv) Technical co-efficients of production are not fixed
- v) Existence of diminishing returns.

Clark's theory was severely attacked for the restrictive assumptions made as well as considering only the demand side.

Marshall's refinements included the supply aspects and the theory has now been discussed universally. Now, we shall study the determination of factor price as it stands today.

25.4.1 Demand for factors in Perfectly competitive markets

Demand for factor is a derived demand based on the demand for the goods produced by employing that factor. That is to say, if demand for product increases, demand for factors also increases and vice-versa. Since perfect competition is assumed to exist, the firm cannot alter the price of its product or the price it pays for the factor. It purchases as much factor as it requires at the market factor price which is determined by the forces of supply and demand in the factor market.

The demand for a factor is determined by what it contributes to the total output at the margin. While employing a factor, a producer is not interested in the marginal physical product (MPP) per se but in the money variant of it—the marginal revenue product (MRP).

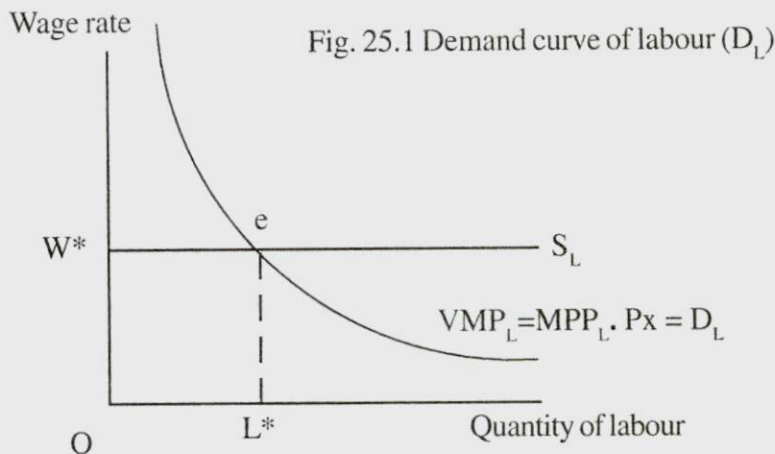
MRP of a factor can be defined as the addition to total revenue due to employment of one more unit of the factor. It is simply the MPP multiplied by the product price (P_x). Since under perfect competition $P_x = MR$, MRP of factor, say labour, under perfect competition can be calculated as:

$(MPPL_x)(P) = VMP_L$, which is the value of marginal product of labour where as in imperfect competition it will be; $(MPP_L)(MR) = MRP_L$

Test Your Progress

1. Recollect the meaning of factor payments
2. What do you understand by the neo-classical approach?
3. Why is the demand for factors derived demand?
4. How is MRP_L calculated?

Now you can use the VMP_L concept to the employment decision by the firms. A profit maximizing firm will always keep comparing the MR with the marginal factor cost (MFC). As long as $VMP > MFC$, the firm should hire additional units of the factor. If the $VMP < MFC$, it pays the firm to withdraw some units of the factor. Only when $VMP = MFC$, the firm will be maximizing profits. Thus for employment of labour, the profit maximizing level is where $VMP_L = W$, where W =wage rate. Thus the VMP curve (VMP_L for labour) itself is the demand curve for labour at different level of costs (W for labour). The same is shown in diagram 25.1.



The demand curve is as usual downward sloping—more hours of work demanded at a lesser wage rate and vice-versa. Diagram 25.1 also exhibits the equilibrium (profit maximizing) condition for the firm.

Because labour market is perfectly competitive, the supply curve of labour facing the firm is a horizontal straight line at the prevailing wage. The profit maximizing firm will hire L^* units of labour at the point where $VMP_L = W$ ($VMP = MFC$)

Thus, the marginal productivity theory of factor pricing provides similar rules for the level of input choice as for that of output choice, i.e INPUTS AND OUTPUTS ARE SO CHOSEN THAT THE MARGINAL REVENUE (FROM THE SALE OF OUTPUT) IS EQUAL TO THE MARGINAL COST (FROM THE PURCHASE OF INPUTS). And this result holds good in both competitive and non-competitive markets.

In case of the situation where two factors—labour and capital - are variables the problem of choice becomes difficult as change in relative factor prices results in change in demand for the factors. That is, as wage rate falls,

more labour will be demanded with same capital. But as labour becomes less expensive, the marginal cost of production falls, which makes it profitable for the firm to increase output. As a result, the firm may invest more in capital equipment also. Expansion of capital increases the VMP_L of labour which in turn increases the quantity of labour demanded. This is shown in figure 25.2.

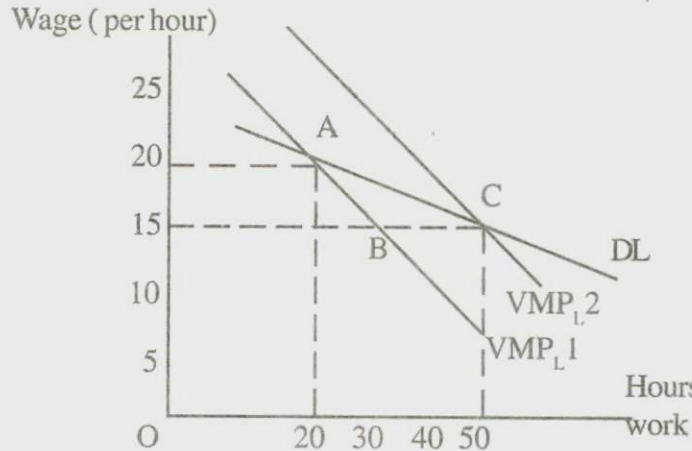


Figure 25.2: Firm's demand curve for labour with variable capital.

At a wage rate of Rs. 20 per hour, the firm hires 20 worker-hours as shown by point A on $VMP_L 1$. When the wage rate falls to Rs. 15 Per hour, the demand for labour increases to 50 worker-hours at point C on $VMP_L 2$ rather than 30 worker-hours on $VMP_L 1$. Because, the lower wage rate motivates the firm to hire more capital as well with the expansion of capital, the VMP_L obviously shifts to the right and the firm will hire more worker-hours than if only one input was variable. Thus the demand curve for labour is a curve that joins points A and C on the two different VMP_L curves. Also notice that the D_L is more elastic than either of the two VMP_L curves. Thus, when capital too is variable, in the long run, there is greater elasticity of demand because firms can easily substitute capital for labour.

Thus, to summarize, the demand for a factor depends upon:

- 1) Price of the factor
- 2) MPP of the factor
- 3) Price of the commodity produced by the factor,
- 4) The amount of co-operating factors
- 5) Price of other factors and
- 6) Technological progress.

Market Demand Curve: Similar to the derivation of market demand curve for products the market demand curve for factor can be obtained through horizontal summation of individual firm's demand curve at different factor prices.

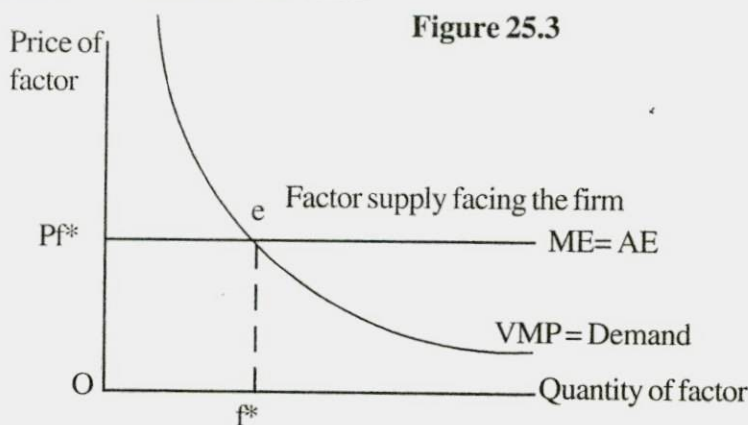
25.4.2 Supply of Factors of Production

Having understood the nature of demand for factors, let us study the nature of supply of factors. First we shall consider supply of inputs to a firm and then their market supply.

25.4.2.1 The supply of Inputs to a Firm

In a perfectly competitive factor market a firm can purchase any amount of that input at a fixed price. That is the factor supply curve facing a firm is perfectly elastic because the firm is an infinitely small part of the market and can buy any amount of it without affecting its price.

In a way, the supply curve facing the firm is an average expenditure (AE) curve because it represents the expenditure that the firm must make per unit of input that it purchases. The marginal expenditure (ME) curve represents the expenditure of the firm for each additional unit of input it buys. As shown in figure 25.3 in a perfectly competitive market, the AE and ME curve are identical and horizontal for each firm.



How much of the input should a firm employ in such a situation? As long as $VMP > ME$, profit can be increased by purchasing additional inputs. On the other hand, if, $VMP < ME$, profit can be increasing by retiring some units of inputs. Therefore when $VMP = ME$ profits of the firm are maximized. We have already established that firms maximize profits at $VMP = MPC$ and therefore, the condition for profit maximization can be rewritten as: $ME = MFC$ or $ME = W$ in case of labour.

25.4.2.2 Market Supply of Factors

The market supply of a factor is usually upward sloping. Considering the individual factors of production, while there is a controversy regarding the fixity of supply of land, the capital and organisation have usual upward sloping shape, labour often has a backward bending supply curve. It is believed that although absolute supply of land is fixed, the supply of arable land is not; depending on the returns, additional land can be reclaimed for cultivation. Similarly backward bending supply of labour may be true for an individual but not so for the market. This is because, higher wages may attract additional workers. Thus, the supply of factors can be safely presumed to be upward sloping.

25.4.3 Market Equilibrium

Having derived the supply and demand for factors, the equilibrium factor price can be determined at the intersection of the two curves. It is shown in figure 25.4.

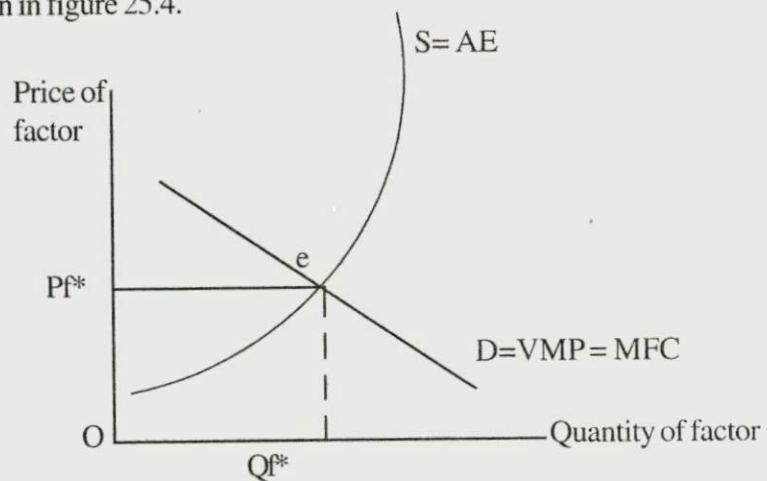


Figure 25.4: Equilibrium factor price and employment level for a competitive industry.

Point 'e' is the equilibrium point corresponding to which P_f is the equilibrium factor price and Q_f is the equilibrium quantity of factor employed by the industry.

Thus, you observe that the same demand-supply forces determine the product as well as factor prices. But what differentiates the two is the determinants of supply and demand forces. While demand for factors is derived demand, the supply of certain factors mainly labour is not cost-determined.

25.4.4 Summary

In the foregoing discussion you learnt how the prices of factors of production can be determined by using the marginal productivity theory. We acknowledged that like commodity prices the factor price too are determined by the same forces of supply and demand. Assuming perfect markets, the same equilibrium condition-marginal revenue being equal to the marginal cost holds good. Hence while at the industry level factor price is determined at the interaction of factor supply and demand curves, the firm employs at a level where value of marginal product (VMP) is equal to marginal factor cost (MFC).

Self Assessment Questions:

- i) Why demand for a factor is more elastic in the long run?
- ii) State why the factor supply curve is upward sloping for an industry.

25.5 Product Exhaustion Theorem

The Adding-up Problem:

In the late 1930's considerable controversy surrounded the problem whether the factor prices determined by the marginal productivity theory would satisfy the basic accounting identity i.e.,

Value of Product = cost of labour + Cost of capital

$$PQ = WL + r k \text{ ————— } 1$$

Where P = Price of output

Q = Output

W = Wage rate

L = quantity of labour

R = rental of capital

K = quantity of capital

This identity requires that the factor shares add to unity. Dividing equation (1) by P.Q we have

$$1 = \frac{WL}{PQ} + \frac{rk}{PQ}$$

$$1 = \text{Share of labour} + \text{Share of capital} \quad \text{-----} \quad 2$$

The value of the product must be exhausted by the factor payments. The question is whether the marginal productivity theory determines factor prices at the levels required to fulfill the basic identity "product = income". The answer to this question is 'yes', if the physical output is exhausted by paying each factor its marginal physical product. That is if

$$Q = (MPP_L)L + (MPP_K)K \quad \text{-----} \quad 3$$

If we multiply equation 2 by P, then we have

$$PQ = (MPP_L \times P)L + (MPP_K \times P)K \quad \text{-----} \quad 4$$

Value of Output = Value of Labour + Value of Capital

Thus from (4) we see that if the factors are paid a price equal to their value of marginal product $(MPP_L \cdot P) = (MPP_K \cdot P)$ the total factor payments will exhaust the total value of the product that is, the marginal productivity theory leads to the correct 'adding-up' of the factor shares.

Euler's product exhaustion theory.

The mathematician Leonard Euler proved that the above expression (3) holds for production functions which exhibit constant returns to scale i.e., production functions which are linear homogeneous. Euler's theorem states that for a production function with constant returns to scale.

$$Q = \frac{\delta Q}{\delta L} \cdot L + \frac{\delta Q}{\delta K} \cdot K \quad \text{-----} \quad 1$$

$$\text{Where } \frac{\delta Q}{\delta L} = MPP_L, \quad \frac{\delta Q}{\delta K} = MPP_K$$

Consider a production function; $Q = f(L, K)$ which is homogeneous of degree n , then Euler theorem states that

$$L = \frac{\delta Q}{\delta L} + K \frac{\delta Q}{\delta K} = nQ \quad \text{--- 2}$$

with constant returns to scale i.e., $n = 1$

$$L = \frac{\delta Q}{\delta L} + K \frac{\delta Q}{\delta K} = Q \quad \text{--- 3}$$

multiply equation 3 by P , we have

$$L \frac{\delta Q}{\delta L} \cdot P + K \frac{\delta Q}{\delta K} \cdot P = PQ \quad \text{--- 3}$$

$$L (MPP_L \cdot P) + K (MPP_K \cdot P) = PQ$$

(Value of labour) + (Value of capital) = Value of output :

that is, if the production function is constant returns to scale, and factors are paid according to value of their marginal productivity, then the total value of output is exhausted and their shares add-up to unity. Thus the factor prices determined by the marginal productivity theory satisfies the basic accounting identity.

25.6 Elasticity of Technical Substitution

In the previous section you were introduced to the determination of factor price using the marginal productivity theory. In this section, we will study how changes in factor prices affect the factor shares and consequent income distribution.

You are aware that, as factor price changes, the firm will substitute a cheaper input for a costlier one. This will lead to a change in K/L ratio and hence the change in relative shares of the factors. The size of this effect depends on the responsiveness of the K/L ratio to the factor price changes. This responsiveness of the K/L ratio to the factor price changes is called as the elasticity of substitution (σ).

So, how do you define elasticity of substitution? Recall the definition of price elasticity of demand. In the same manner elasticity of substitution can be defined as the ratio of the percentage change in the K/L ratio to the percentage change of the marginal rate of technical substitution of labour for capital ($MRTS_{LK}$). That is

$$\sigma = \frac{\delta (K/L) / (K/L)}{\delta (MRTS_{LK}) / (MRTS_{LK})} \quad \text{-----} \quad 1$$

As you have learnt earlier, under perfectly competitive equilibrium, the firm chooses the input combination at which MRTS is equal to the ratio of factor prices,

$$MRTS_{LK} = \frac{w}{r}$$

Thus, in equilibrium with perfect factor markets the elasticity of substitution may be rewritten as:

$$\sigma = \frac{\sigma (K/L) / (K/L)}{\sigma (w/r) / (w/r)} \quad \text{-----} \quad 2$$

Since the numerator and denominator move in the same direction, the sign of σ is always positive. This is because wherever w/r increases labour becomes relatively expensive which will induce the firm to substitute capital for labour, so that K/L ratio increases. Conversely a decrease in w/r will result in a decrease in the K/L ratio.

The value of σ ranges from zero to infinity. If $\sigma = 0$, substitution is impossible and it means that K and L are used in fixed proportions and the shape of the isoquant is right angled. If $\sigma = \infty$ the two factors are perfect substitutes the isoquants being straight lines and negatively sloped.

If $0 < \sigma < \infty$, factors can be substituted each other to a certain extent and isoquants are convex to the origin. In general the larger the value of σ , the greater is the substitutability between the two factors.

σ may be classified into three categories :

$\sigma < 1$: inelastic substitutability

$\sigma = 1$: Unitary substitutability

$\sigma > 1$: elastic substitutability

For different values of σ , factor shares will be different.

By Definition [Share of labour] = $\frac{W L}{X}$ and [Share of capital] = $\frac{r k}{x}$

The relative factor shares are $\frac{\text{Share of L}}{\text{Share of K}} = \frac{W L}{r k}$ or

$$\frac{\text{Share of L}}{\text{Share of K}} = \frac{(W/r)}{(K/L)} \quad \text{--- 3}$$

That means a change in the relative factor price ratio (w/r) will affect the relative shares of the two factors.

If $\sigma < 1$, a given percentage change in w/r ratio results in a smaller percentage in the K/L ratio, so that the value of equation (3) increases. That is if $\sigma < 1$, an increase in the w/r ratio increases the distributive share of labour.

For example, assume that $\sigma = 0.5$. Then a 10 percent increase in w/r results in a 5 percent increase in K/L ratio. The new relative factors shares are:

$$\frac{W L}{R k} = \frac{w/r (1 + 0.10)}{K/L (1 + 0.05)} = \frac{1.10}{1.05} = \frac{(w/r)}{K/L} > \frac{W L}{r k}$$

Thus (new relative shares ratio) > (initial relative shares ratio)

If $\sigma < 1$, a one percentage change in w/r leads to a greater relative change in K/L , so that the relative share of labour decreases. For example if $\sigma = 2$, a 20% change in w/r leads to a percentage in K/L . The new relative shares will be

$$\left(\frac{WL}{Rk} \right) = \frac{1.2}{1.4} \quad \left(\frac{WL}{rk} \right) < \frac{WL}{rk}$$

That is, if $\sigma > 1$, the relative share of labour decreases following an increase in the w/r ratio. Similarly if $\sigma = 1$, the relative shares of labour and capital will remain unchanged.

It should be noted that there is a two-way causation between w/r and K/L . Changes in K/L ratio result in changes in the relative shares of the factors to total output.

Therefore the concept of elasticity of substitution is very important in the neo-classical theory of income distribution. It is very useful in examining the way in which changing input prices or input ratios affect income shares.

Review Question

- Why are the factors substituted among each other?
- How is elasticity of substitution measured?
- What is the effect of changing elasticity of substitution on factor shares?

25.7 Technical Progress and Factor Shares.

Technological change takes place continuously and this results in a shift in the production function. Consequent upon the shift in the production function, K/L ratio undergoes change along with elasticity of substitution.

Technological progress can be of 3 types: neutral, Capital-intensive and labour intensive. Technological progress shifts the isoquants downwards indicating that the same level of output can be produced with smaller quantities of inputs.

- a) Technological progress is neutral if at a constant K/L ratio, the $MRTS_{LK}$ remains unchanged. Since in equilibrium $MRTS_{LK} = w/r$, whenever technological progress is neutral to both the K/L ratio and the w/r ratio will remain unchanged and so the relative shares of factors.
- b) Technological progress is capital deepening if at a constant K/L ratio $MRTS_{LK}$ declines. This implies that at equilibrium the w/r ratio declines that is, r increases relative to W while K/L remains constant consequently the ratio of factor shares declines. Wherein the share of labour decreases while that of capital increases.
- c) Technological progress is labour deepening if at a constant K/L ratio, the $MRTS_{LK}$ increases. Then at equilibrium the w/r ratio increases as technological progress takes place. This implies that the share of labour will increase and the share of capital will decrease.

It is a common knowledge that technological progress leads in general to a change of the K/L ratio. In fact K/L ratio have shown an upward trend overtime in all industries. This development has led Marxian economists to forecast an increase in capital's share and hence a decrease in labour's share. This prediction has not been realized. In most developed countries factor shares have revealed considerable stability overtime. The increase in capital deepening (K/L ratio) has resulted in increases of w/r, which apparently, have not been taken into account in the above mentioned predictions. To avoid such misleading predictions it is preferable to analyze the effects of technological progress with the use of elasticity of substitution.

25.8 Let Us Summarize

The functional distribution of income indicates that income produced in a given period in the economy is distributed among the factors of production. The share of a factor in the total income produced depends upon their respective prices. The question is how are the factor prices determined? The different schools of thought provide varied opinions regarding the same.

However a general theory of factor price determination using the supply and demand forces has been put forward by the neo-classical economists. The employer hires a factor till the price paid to it equals its marginal productivity expressed in value terms (value of marginal productivity, VMP). Although, there are few restrictive assumptions, the theory is accepted to provide a general solution to the problem of factor pricing.

Another interesting controversy viz, whether the factor shares exhaust or add-up to the total output was also discussed. Euler's contribution in this regard supports the claim. You also learnt some of the related topics such as technical substitution, technological change and their consequent impact on factor shares.

Review Question.

1. Critically evaluate the marginal productivity theory of factor pricing.
2. Briefly explain the adding – up controversy.
3. Analyze the impact of technological change on factor prices.

Key – words:

1. **Income distribution:** The division of total income between different recipients. Division income between the factor owners is called functional distribution of income. Division of income classified by size is called personal income distribution.
2. **Factor shares:** The share of each factor in the total output-income measured at current prices. Factor shares depend upon their respective prices.
3. **Factors prices:** The prices of the services of factors of production. So the price of labour is wage. Similarly, rent for land, interest for capital and entrepreneur gets profit.
4. **Marginal productivity:** The extra value of potential output at current prices, resulting from a given increase in inputs.
5. **Demand for factors:** Amount of factors that an industry or a firm is willing to purchase at each possible price. Demand for factors is a derived demand based on the demand for the goods produced. If demand for a product increases demand for factors needed also increases and vice-versa.
6. **Supply of factors:** Amount of factors that the factor owners are willing to supply at each possible price.
7. **Product Exhaustion Theorem:** A mathematical theorem developed by Leonard Euler relating marginal to average products. The theorem states that if the production function is constant returns to scale and factors are paid according to value of their marginal productivity, then the total value of the output is exhausted and their shares add-up to unity.

8. **Elasticity of technical substitution:** The ratio of proportional change in the relative quantities of two inputs used by a firm to proportional change in their relative prices, holding total output constant.
9. **Technical progress:** Improvement in knowledge of possible techniques of production. Such changes may allow more output to be obtained from unchanged inputs, or the same output to be obtained from fewer inputs or new forms of output to be produced which were not previously possible.

Reference:

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- b) Sen A (1999) : Micro economic theory and Application, Oxford University Press, New Delhi.
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NOTES

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UNIT 26: FACTOR PRICING IN IMPERFECTLY COMPETITIVE MARKETS.

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UNIT 26: FACTOR PRICING IN IMPERFECTLY COMPETITIVE MARKETS.

26.1 Objectives

The objectives of this unit are

- i) to understand the mechanism of factor pricing under different kinds of imperfections in both product as well as factor markets and
- ii) to apply marginal productivity theory to imperfect market situation.

26.2 Introduction

In unit 25 you learnt how the factor prices are determined when perfect competition exists in both factor and product markets. However, real world is full of imperfections. Therefore, you should also know how factor prices are determined when imperfections exist. The marginal productivity theory of distribution introduced in the last unit can be extended to study the factor price determination under imperfect competition.

26.3 Monopoly in the product market

26.3.1 Single variable factor pricing

In this model let us assume that the firm uses a single variable factor, labour, whose market is perfect. The wage rate is given and supply curve to an individual firm is perfectly elastic. But let us also assume that the firm has monopolistic power in the product market. That is to say, the demand for the product of the firm is downward sloping and marginal revenue (MR) is smaller than price at all levels of price. This is shown in figure 26.1(a).

Under these conditions, the demand curve for the variable factor, labour is not the value of marginal product (VMP_L) but marginal revenue product (MRP_L) defined by multiplying the MPP_L times the MR of selling the commodity, i.e., $MRP_L = MPP_L \cdot MR_x$. The nature of MRP_L curve is shown in figure 26.1(b).

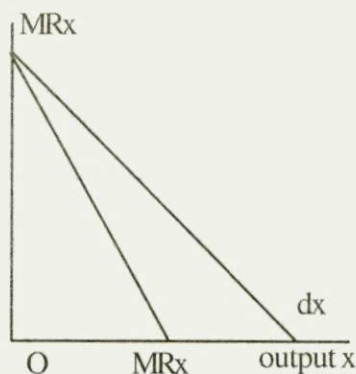


FIGURE 26.1(a)

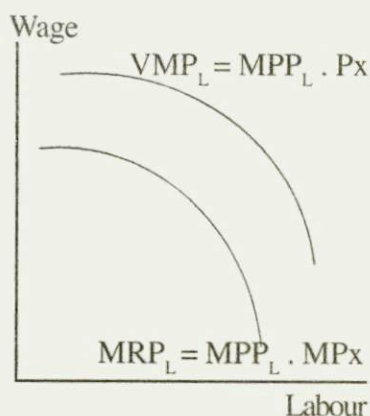
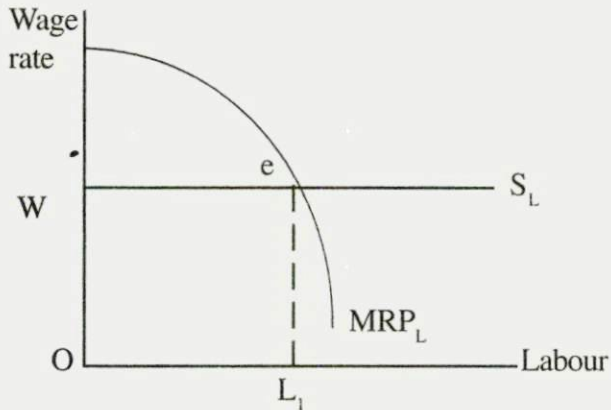


FIGURE 26.1(b)

Unlike under perfect competition the price received by the firm declines as output increases, hence, $MRP_L < VMP_L$ at all levels of wages. This MRP_L itself is the demand curve for labour.

Since perfect competition is assumed in the factor market the supply curve of labour will be a horizontal straight line at the market wage rate (see figure 26.2)

Figure 26.2: Demand curve for labour



The firm being a profit maximiser, will be in equilibrium at point 'e' and employment of the factor at L_1 . At this point $MRP_L = W = MC_L$. To the left of L_1 , extra units of the factor will add to the profit because $MRP_L > MC_L = W$. On the other hand, to any point, on the right of L_1 , additional unit of factor adds more to cost than revenue because $MRP_L < MC_L = W$. Hence it pays to reduce the employment of labour. Therefore, a profit maximizing firm will employ labour upto the point where $MRP_L = W$.

26.3.2 Demand for a variable factor when several variable factors are used.

When more than one variable factor is used the demand for a variable factor is not its MRP curve, but is formed from points on shifting MRP curves. As shown in figure 26.3, if the market wage is W_1 , and with initial MRP_{L1} , the monopolistic firm is in equilibrium at point A.

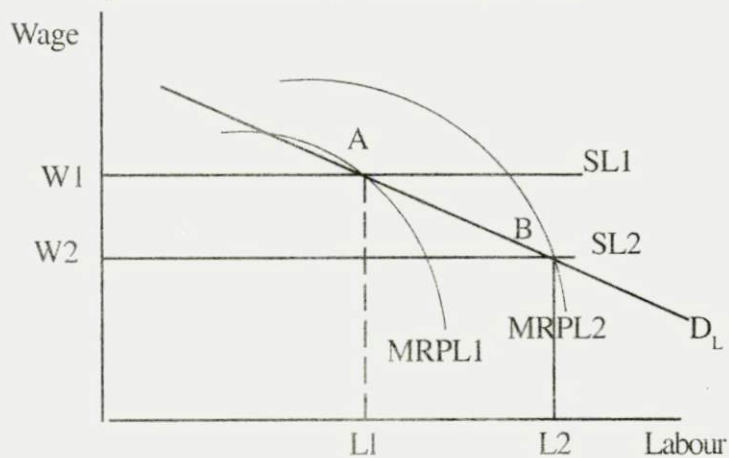


Figure 26.3: Demand for labour when capital is also variable in a monopolistic firm.

Now if the wage rate falls to W_2 , the firm would move along MRP_{L2} if other things remained equal. However, the fall in the wage rate has a substitution effect, an output effect and profit-maximising effect as in the case of a perfectly competitive firm. Because of these the MRP curve shifts to MRP_2 and a new equilibrium point B is reached, where the employment of the factor is L_2 . Generating points such as A and B at various levels of wages we obtain the demand curve of labour – D_L . Once again D_L is more elastic here than if only one factor were to be variable.

Thus demand curves for factors are negatively sloped, irrespective of the conditions of competition in the product market.

26.3.3 Market Demand and market supply of labour.

The market demand for a factor is the summation of the demand curves of the individual monopolistic firms.

The market demand curve for labour will also be negatively sloped.

Similarly, the market supply curve is also the summation of supply curves of individuals and is upward sloping.

The market price of the factor is determined by the intersection of the market demand and market supply as shown in figure 26.4.

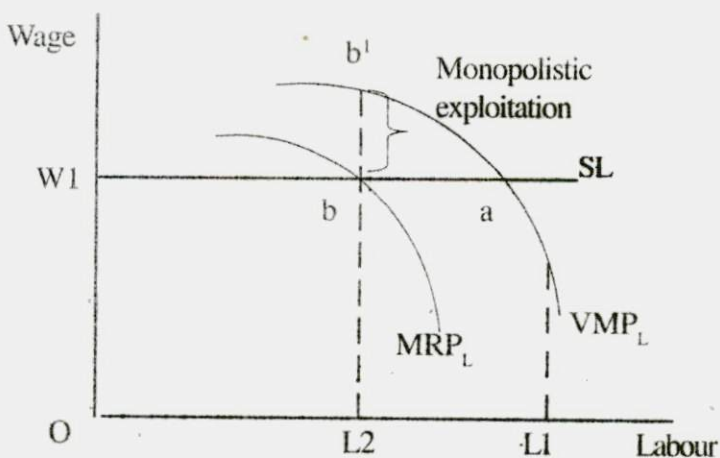


Figure 26.4: Equilibrium factor price for the firm

However, since the market demand here is based on MRP_L rather than the VMP_L firms pay according to MRP rather than VMP . Thus monopolistic firm pay less than what would have been paid by a competitive firm. This is called as the monopolistic exploitation (section bb^1 in figure 26.5) by Joan Robinson.

The equilibrium for the market is as shown in figure 26.5.

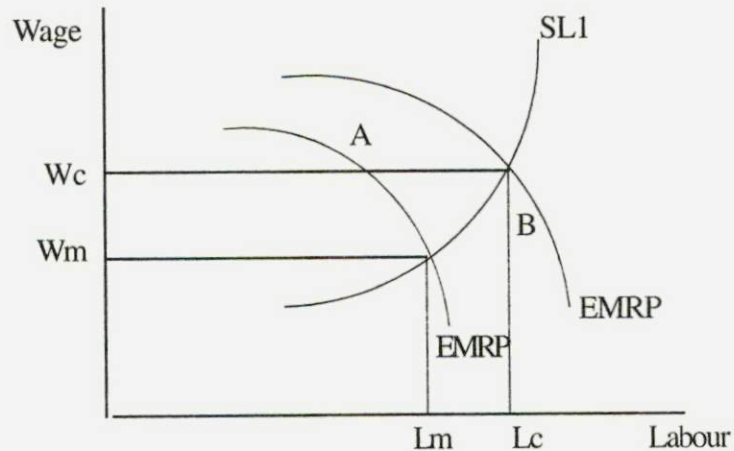


Figure 26.5: Market equilibrium and factor price

For the monopolistic firm since profit-maximising condition is $W=MRP$, it employs L_m labour and pays W_m wage. This is clearly lower than the competitive employment (L_c) and wage (W_c).

27.4 Factor pricing when the firm has monopolistic power in the commodity market and monopolistic power in the factor market.

26.4 Equilibrium of a monopolist using single variable factor.

In this case the demand for labour by the individual firm is the same as in 26.3.1. The demand for labours by monopolistic firm is MRP_L .

The supply however, is not perfectly elastic. Because the firm is assumed to be monopsonist the supply curve of the factor has a positive slope, i.e., if the firm wants to buy additional units of the factor it has to pay a higher price for it. The supply of labour shows (S_{L1}) the average expenditure (AE) or the price that the firm must pay at different levels of factor use. From this AE we can calculate the total expenditure (TE) on the factor and

subsequently, the marginal expenditure (ME) of purchasing an additional unit of the variable factor. Hiring an additional unit of input increases the TE on the factor. That is to say ME lies above the AE or S_L curve. This is illustrated in figure 26.6.

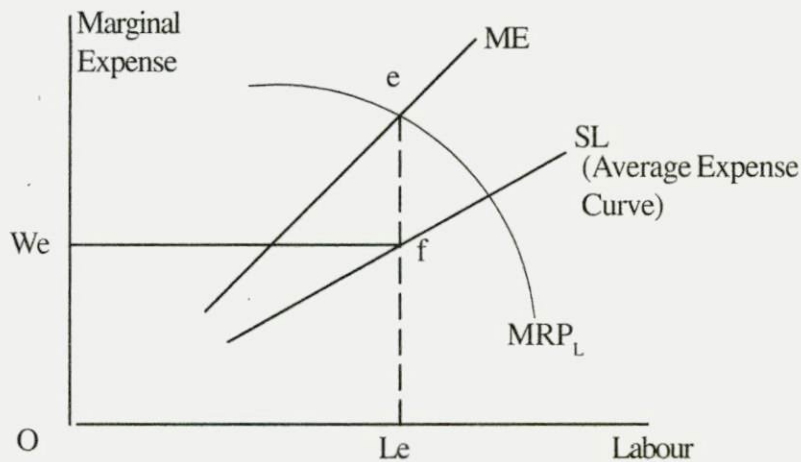


Figure 26.6: Factor price of this model.

The firm is in equilibrium when it equates the ME on the factor to its MRP. This is at point e, employment at L_e , and wages at W_e . However you should notice that the factor is paid even less than MRP. Which can be called as the monopsonistic exploitation.

Therefore if you recollect:

- The factor is paid its VMP under perfect competition.
- If the firm has monopolistic power in the product market the factor is paid its MRP, which is less than the VMP.
- If the firm has monopoly power in the product market monopsony in the factor market, the factor is paid even lower than its MRP.

Self Assessment Questions:

- What is the supply curve facing a monopolist firm called AE?
- What is ME .
- What is the difference between monopolist and imonosonist exploitation?

26.4.2: Equilibrium of a monopolist-monoposonist who uses several inputs.

You have already learnt that a firm using two variable factors is in equilibrium when

$$\frac{MPP_L}{MPP_K} = \frac{W}{R} \quad \text{or}$$

$$\frac{MPP_L}{W} = \frac{MPP_K}{R}$$

In monopsonistic factor markets W and r undergo frequent changes as the amount of factors employed causes changes in the prices of factors. The monopsonist, therefore has to look at the ME of the factors. The input combination at which the ratio of MPP to the ME is equal for all variable inputs is the equilibrium condition.

That is $MRTS_{LK} = \frac{MPP_L}{MPP_K} = \frac{ME_L}{ME_K}$ or

$$\frac{MPP_L}{ME_L} = \frac{MPP_K}{ME_K}$$

The above equation implies that the firm is getting exactly in physical terms from the factors what it pays to them at the margin.

Self-Assessment Question.

How does factor pricing under imperfect competition differ from that under perfect competition?

26.5 Bilateral monopoly

In this model, we assume that all firms are organised in a single body which acts like a monopsonist, while the labour is organised into a union which acts like a monopolist. Thus, we have a situation where in monopolies exist both on the supply as well as the demand side.

KSRTC buying the services of organised bus drivers is an example of bilateral monopoly.

In case of bilateral monopoly, the model suggests upper and lower limits within which the wages will be determined by bargaining and therefore the solution will be indeterminate. Since bargaining depends upon bargaining skills, political and economic power of the labour union as well as of the firm, the results of the bargaining will not be certain. The situation can be depicted as in figure 26.7.

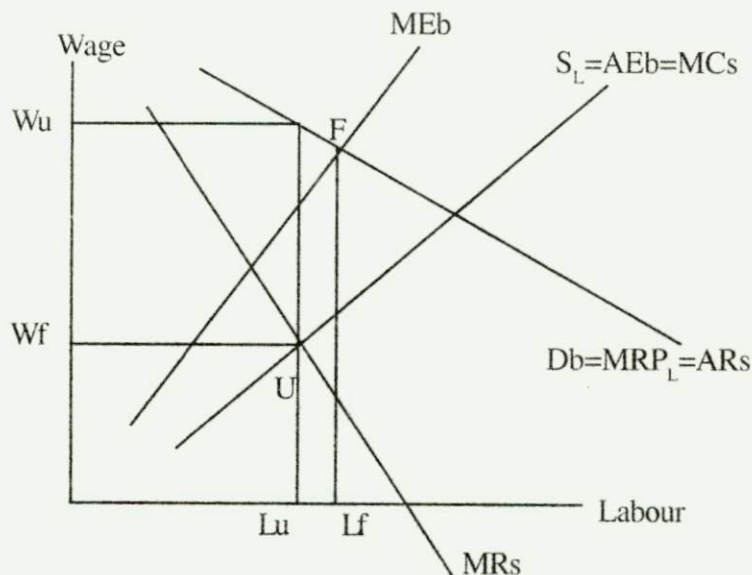


Figure 26.7: Factor pricing under bilateral monopoly.

The monopsonist's demand curve is Db , which is the MRP_L of the factor demanded. From the point of the seller of the factor-monopolist union – it is the average revenue (AR) curve and MRs is its marginal revenue (MRs) curve. As usual MRs lies below ARs .

S_L is the supply curve of labour facing the monopsonist indicating his average expense (AEb). Corresponding AEb, MEb is his marginal expense curve.

Given the above cost and revenue curves, the monopsonist will maximize his profits at a point where his MEb is equal to the MRP_L at point F in figure 27.7. At this point, the monopsonist seeks to hire L_f workers and pay W_f (AE corresponding to F) wage.

The monopolist union, on the other hand, will be in equilibrium at a point where $MRs = MCs$. i.e., U in the figure. At this point the monopoly will be supplying L_u quantity of labour at W_u wage rate. Thus W_u acts as the upper limit – the minimum price at which the union wishes to sell labour and W_f acts as the lower limit – the maximum price at which the monoposonist firm wishes to buy labour.

In such a situation, economic analysis will not yield a determinate solution. The level at which the price will be settled depends upon the relative bargaining skills and power of the two parties. Therefore in this case the price is indeterminate.

26.6 Summary

Hence you notice that factor price determination under imperfect competition although adopts the same analysis of supply and demand forces, varies a little bit from that under perfect competition.

Since factors are paid according to their MRP and not VMP; and the firms consider their marginal expenditure on the factors rather than the average expense, the factor price under imperfect competition is lower than that under perfect competition. So is the level of factor employment. Because of this we noticed that, there is an element of monopolistic and monopsonistic exploitation, as the case may be.

Review Questions

- a) Compare the equilibrium in a market in which a firm is both a monopoly and monopsony to the competitive one.
- b) Discuss why price under bilateral monopoly is indeterminate.

Key-words: Value of marginal product (VMP); Substitution effect; monopolistic exploitation; Average Expenditure on the factor, Marginal Expenditure on the factor; bargaining.

26.7 Theory of Rent.

26.7.1 Introduction.

Rent has a different meaning in Economic that what is usually understood. In common parlance 'rent' is any periodic payment made regularly for hiring of a good or service. That is when you do not buy a thing but use it, you pay rent for its use. But in economics it is used for payments made for factors of production that are limited in supply like the land. Where as the earlier economists led by David Ricardo viewed that rent is a factor payment to land, the modern view is that rent can be earned by any factor of production. Thus the earlier concept of rent is also called as the 'differential' rent that arises from the differences in the quality of land; the modern concept is called as the economic rent.

In this section, first you will study Ricardian theory and then the modern theory of rent.

26.7.2 Ricardian Theory of Rent.

Ricardo a classical economist, was the first economist to examine the concept of rent in detail and propound a systematic theory. Ricardo defines rent as 'that portion of the produce of the earth which is to be paid to the landlord for the original and indestructible powers of the soil'. Although Ricardo gave a very restricted meaning of rent, later on economists like Marshall widened the meaning of rent as a payment for all free gifts of nature'.

Ricardo assumes different qualities of land of which the best or the most productive land is first cultivated. Till this grade of land alone is cultivated it commands no rent. But as population rises demand for land increases and as the best quality land is scarce, the next grade land will be brought under cultivation. The productivity of this land is lower than the best grade land. The differential earning of the best grade land over the next grade land is defined by Ricardo as rent. This process goes on till the last quality land is cultivated. The grades of land other than this last quality land earn rent, but not this one. This land which doesnot earn rent is called as the inarginal or no rent land.

Assuming three grades of land and usual cost curves, Ricardian rent can be depicted as in figure 26.8.

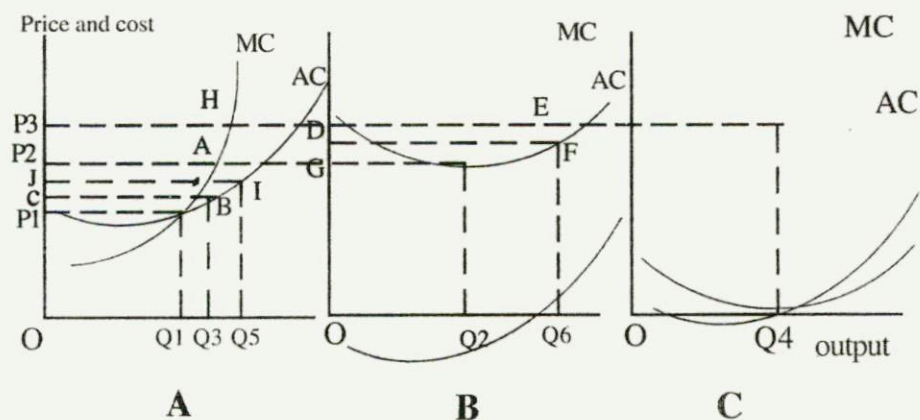


Figure 26.8: Ricardian Approach to Determination of rent.

Panels A, B and C in figure 26.8 refer to best, good and inferior quality land. Initially when only A grade is land is cultivated, OQ_1 output is produced and sold at OP_1 price at which no rent exists. But when cultivation extends to B grade land, the production will be at OQ_2 on that land and the price will be at OP_2 . Though B grade land does not get any rent, A grade land at P_2 produces OQ_3 and earns a rent of P_2ABC . This arises to lower productivity on B grade land. At price AP_2 production on A grade land produce OQ_3 output. When cultivation extends further to C grade land, the price increases to OP_3 , Grade B land, $DEFG$ amount of rent and grade A land earns P_3HIJ amount of rent while production on grade B land increases to OQ_6 , that on grade A land increases to OQ_5 . C grade land is marginal or no rent land. The rent on B grade land is equivalent to $DEFG$.

Therefore Ricardian rent is essentially a surplus or differential rent.

The some analysis can be extended to intensive cultivation where the successive doses of inputs bring progressively diminishing output. That does where the output is just equal to the cost is the marginal doses and the earlier doses earn differential profit. Figure 26.8 can be used to explain this phenomenon.

Self Assessment Question:

Can you explain the determination of rent under intensive cultivation using figure 27.8?

However, Ricardo's theory has been criticized on various counts:

1. Soil also contains man-made power along with 'original' powers and its powers are destructible.
2. It is not always true that people cultivate the best land first.
3. 'No rent' or marginal land does not exist.
4. Ricardo discusses only differential rent but scarcity rent is more common.
5. Assumption of perfect competition is incorrect.
6. Rent is not exclusive to land alone it can accrue to other factors of production also.

Despite these criticisms Ricardo was able to analyze rent systematically and provided a starting point for discussing it in all its manifestations.

26.7.3 Modern Theory of Rent

Ricardo based his analysis believing that land has only one use of growing corn. The alternative uses of land were not considered and therefore the opportunity cost of land was thought to be nil. In such a situation, the landlords would prefer to rent out their land for some return than keep it idle. Therefore Ricardo argued that rent is a surplus over and above what is necessary to keep it in its present use.

It is in these terms that Joan Robinson defined rent stating that it is a surplus payment to a factor over and above what was necessary to keep it in its present use. That is to say rent can be earned by any factor (Joan Robinson, 1961).

Joan Robinson further states that the minimum payment that has to be made to a factor to retain it in its present use is the transfer earnings. This is because a reduction of payment below this price would cause the factor to be transferred elsewhere. Therefore every factor might be earning over and above its transfer earning (TE). Hence the difference between a factor's actual earning (AE) and TE is the rent earned by that factor.

It can be shown that depending upon the supply of a factor, the rent can be pure economic rent if its absolutely fixed; transfer earnings if it is infinitely available; and partly rent and partly transfer earnings, if it is scarce.

Thus, more elastic the supply curve, the less or the payment to factors that is a rent and the more that is a transfer earning.

Self-Assessment Questions:

- i) Differentiate between differential and scarcity or economic rent.
- ii) How the rent under modern theory is calculated?

26.7.4 Quasi-rent:

There are some factors whose supply is fixed in the short run (for e.g. plant and machinery). If for some reasons, the demand for these increases in the short-run, they earn a surplus over their supply price. This surplus earning was called the quosirent by Marshall, which disappears in the long run as the factor becomes variable. Therefore any factor that is fixed only in the short-run but whose supply could be increased in the long run earns quasi-rent. It can be calculated as the difference between total revenue and total variable costs.

26.7.5 Rent and Price:

Whether rent is determined by the price or is a determinant of it is a question that has discussed for long by the economists. Ricardo by explaining rent as a surplus output on a piece of land over that of another implied that price of agricultural goods determines rent. But the modern economist argue, rightly so, that rent is a surplus or price over cost, price being determined by cost is in turn determined by rent.

26.8 Determination of interest.

26.8.1 Introduction.

Interest is the price paid for using capital. Classical economists, especially Nasu senior, asserted that interest is to be considered as a reward for "abstinence"; compensation for the sacrifice made by the lender. But for people with surplus capital, it would have no relevance. Marshall therefore.

stated that interest is a reward for waiting. Bohm-Bawerk stressed the role of time preference in the sense that people prefer present over the future creating a premium on the present. When this premium exist people will be unwilling to lend money unless they are compensated for that. Irving fisher too followed the foot-steps of Bohm-Bawerk by further extending his theory. However, Keynes argued that, interest is merely a monetary phenomenon that is simply determined by the demand and supply of money. Since liquid money is generally the most preferred by the people Keynes defines interest as the reward for parting with liquidity or the reward for hoarding.

After learning the evolution of theoretical approaches to interest let us study briefly the various theories of interest; the classical theory, the loanable funds theory, Keynesian theory and the modern theory of interest.

26.8.2 Classical Theory of Interest:

The classical theory of interest is the saving and investment theory of interest. According to it, the rate of interest is determined by the interaction of demand for and supply of capital. The theory suggests that whereas the demand for capital is made only for investment purposes and varies inversely with the rate of interest, the source of supply is income which people withhold from consumption and this varies directly with rate of interest.

Let us briefly review the conditions affecting demand and supply of saving.

26.8.2.1 Supply of saving:

Saving is assumed to be interest elastic with people saving more at higher rates of interest. People no doubt, allocate their consumption between present and future, but they always prefer present over the future. Therefore, they save only to the extent that their preference for current consumption is offset by the interest paid for wanting. Higher the payment of interest higher is the saving and hence the saving curve is upward sloping.

26.8.2.2 Demand for capital:

Demand for capital is assumed to be only for investment purposes and interest elastic due to the operation of the law of diminishing marginal returns. The demand is inversely related to interest rate. Thus the demand curve is downward sloping.

26.8.2.3 Determination of Rate of interest:

Once the demand and supply conditions are established the determination of the rate of interest takes place at the intersection of the two schedules as shown in figure 26.9.

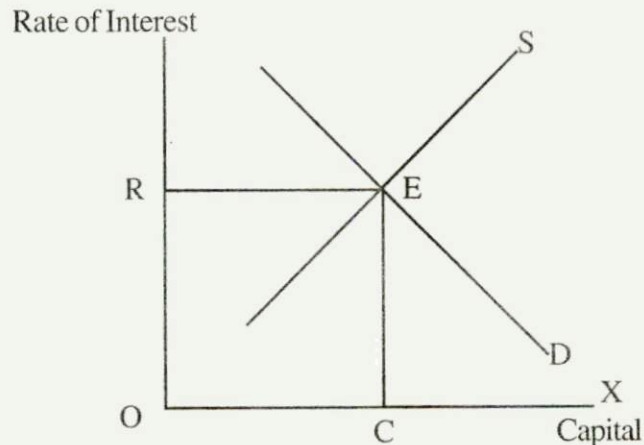


Figure 26.9: Determination of the rate of interest classical approach.

The equilibrium rate of interest is R corresponding to the intersection of the two curves. Any changes in demand and supply, obviously change the rate of interest, and brings about an equality between capital supplied and demanded.

However Keynes is very much critical of this approach. The full employment assumption and the thesis that relationship exists between saving and rate of interest and ignorance of monetary factors are not accepted by him.

The classical theory was reformulated as the loanable funds theory by the neo-classical economists which is presented in the next section.

26.8.2 The Loanable Funds Theory of Interest.

26.8.2.1 Introduction.

The ignorance of monetary factors was a serious shortcoming of the classical theory. Some Swedish economist led by Ohlin held the view that interest being the price for the use of money, the determination of interest cannot confine to the real economic variables alone. They said that there are many sources other than saving out of current income and money is demanded for purposes other than investment. Therefore, they specify a loanable funds theory of interest rather than that based on supply of general capital.

This theory also believes that interest is determined by the supply of and demand for loanable funds. Therefore it is essential to study the nature of demand for and supply of loanable funds.

26.8.2.2 The Demand for Loanable Funds.

In this theory, the demand for loanable funds includes not only for investment but also consumption purposes. This demand for loanable funds is interest elastic and downward sloping.

26.8.2.3 The Supply of Loanable Funds.

Although the main source of supply of loanable funds is saving as discussed by the classical, two more components of loanable funds, viz, disharding of previously accumulated cash balance and net addition to the amount of bank credit are added. The supply too is interest elastic but upward sloping.

26.8.2.4 Determination of the rate of interest.

Like in the classical analysis, in this theory also the intersection of demand and supply of loanable funds determine the rate of interest at which the demand for loanable funds is equal to for their supply. This is shown at point E in figure 26.10.

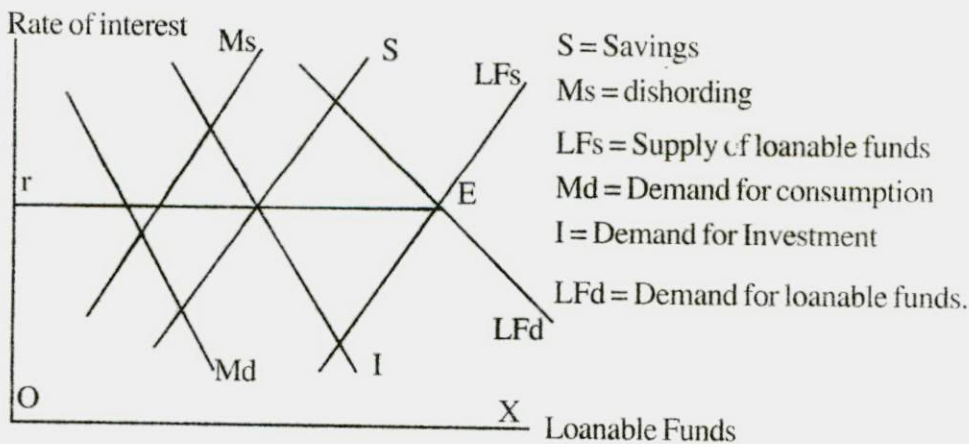


Figure 26.10: Determination of rate of interest: Loanable Funds Approach.

The rate of interest is determined by the intersection of the demand curve for loanable funds (LFD) with the supply curve for loanable funds (LFS).

26.8.2.5 Evaluation:

Loanable funds theory is a definite improvement over that of the classical theory. The monetary factors in the determination of interest, the consumption demand for money and sources of supply other than saving are considered. However Keynes refutes the theory for assuming supply to be interest elastic. Moreover since saving is a function of income, theory of interest determination should address the simultaneous determination of rate of interest and the level of income. In this sense, this theory has limited validity.

26.8.3 Keynes Liquidity Preference Theory.

By treating interest as a monetary phenomenon, Keynes departed from the earlier approaches. Keynes defines interest as the price of money loans and therefore interest is determined on the basis of supply and demand for money. As for as supply is concerned, Keynes states that supply of money is fixed by the monetary authorities.

Demand for money, called as the liquidity preference, is due to three motives viz, transactionary speculative and precautionary motives. The transactionary demand for money is for day to day transaction; the speculative demand for benefiting from the changes in the rate of interest; and the precautionary demand for meeting exigencies of the future. According to Keynes transactions L_1 demand and precautionary demand L_2 depend upon the level of income while the speculative demand L_3 on the rate of interest. Thus demand for money $L = L_1 + L_2 + L_3$ and demand curve is as usual downward sloping.

Thus having determined the supply and demand for money Keynes says that interest is determined at the intersection of the two curves as shown in figure 27.10.

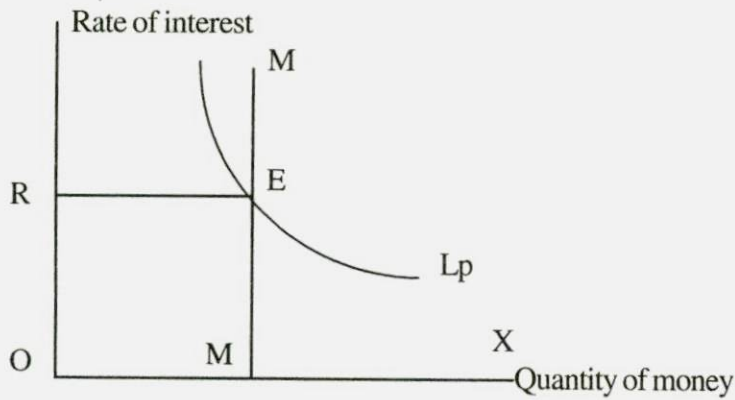


Figure 27.11 : Determination of Rate of Interest.

The equilibrium rate of interest is R. Although as you learnt, Keynesian theory is much more realistic, it also has been severely criticized on the grounds that it is as indeterminate as the loanable funds theory and for ignoring the real factors like thrift. But Keynes theory has made a significant contribution to policy formulation for ensuring growth and stability of the economy.

For self Checking:

Can you identify the monetary and real factors that affect the rate of interest?

Thus, you see that no theory provides a satisfactory solution to the problem of interest rate determination. However, Hicks and Hansen using the neo-classical and Keynesian approaches discuss a new theory called as modern theory. Let us briefly examine the modern theory of interest.

26.8.4 Modern Theory of Interest.

The interest according to this theory is determined by IS and LM curves. Where as the IS is the investment and saving curve designed through the neo-classical approach and indicates the demand side, LM is the liquidity preference curve derived through the Keynesian approach and represents the supply side. The IS is derived through the goods market equilibrium and LM through the money market equilibrium.

26.8.4.1 Equilibrium in the Goods Market

From the loanable funds approach, we get three equations representing the goods market.

Saving function	$S = f(y)$
Investment function	$I = f(r)$
Equilibrium condition	$S = I$

Where S = Saving, I = Investment and r = rate of interest. These are depicted in figure 26.12.

Figure 26.12 Goods Market Equilibrium

Panel A of the figure shows the investment schedule which changes inversely with the rate of interest. The 45 line in panel B shows equality between planned saving and investment. Panel C shows the saving function which is directly related to income. In panel D is the Hicksian downward sloping IS curve which is derived from the other three panels. The IS curve indicates all possible combinations of income and the rate of interest at which the goods market will be in equilibrium. If $S = I$. Thus a downward sloping IS curve is derived.

26.8.4.2 Equilibrium in the money market.

Hicks derives the LM curve with the help of the liquidity preference schedules at various income levels. LM curve represents the various equilibrium levels in the money market at different income levels and the corresponding rates of interest.

Keynes theory gives us the following three equations to represent the money market:

$$\text{Demand for money } M_L = f(y, r)$$

$$\text{Supply of money } M_s = M_d$$

$$\text{Equilibrium condition } M_d = M_s$$

As you have learnt, the transactions demand for money is a function of income and the speculative demand is a function of rate of interest. Money supply is exogenously determined by the monetary authorities and equilibrium in the money market is an equality between demand for and supply of money. Given these the LM curve is derived as shown in figure 26.13.



Figure 26.13 : Money Market Equilibrium

While panel A represents the speculative demand for money that is interest elastic; panel B shows the exogenously fixed supply of money that is allocated among the transactions and the speculative needs. Panel C shows the direct relationship between income and the transactions demand for money and based on these three relations, the LM curve is derived in panel D.

The LM curve shows the combinations of income and rate of interest at which the equilibrium in the money market is determined. It slopes upward.

26.8.4.3 Simultaneous determination of the level of income and the Rate of interest.

A simultaneous equilibrium of the goods and the money market is established when the IS curve intersects the LM curve. This is the equilibrium point and is shown in figure 26.14.

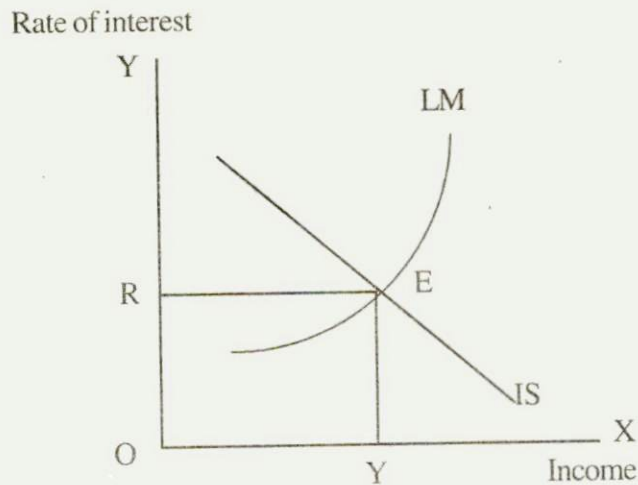


Figure 26.14: Simultaneous Equilibrium of the goods and the money market.

E is the equilibrium point at which the income and rate of interest are simultaneously determined. Any other point indicates a disequilibrium and through adjustment mechanisms of the constituent factors, the equilibrium will be restored.

26.8.4.4 Summary

Thus, the modern theory combines all the earlier concepts and provides a grand theory which represents a general equilibrium of the money market and the goods market.

Self-Assessment Questions:

1. Explain the concept of interest.
2. Discuss why the modern theory of interest is more acceptable to any of the previous theories.
3. Analyse the derivation of IS and LM curves.

26.9 Theory of Profit.

26.9.1 Introduction.

Profit is the reward for the entrepreneur who organizes the factors of production and bears the risks associated with production. You have studied all along that firms aim at profit maximization. Different thinkers have attributed profits to different factors and as such we have different theoretical approaches to profit.

B.S.Keirstad sums up the emergence of profit by stating that “profit may emerge as a result of monopoly or monopsony, as a reward for innovation as a reward for the correct estimation of uncertain factors, either particular to industry or general to the whole economy.

The theories of profit examine the impact of the above factors on profit. Now let us briefly look at some of the theories of profit.

26.9.2 Profit as a dynamic surplus.

J.B.Clark argues that in the dynamics of the real world it is possible to earn surplus which is the profit for entrepreneurs.

Clark identifies five generic changes that constantly take place in an economy.

1. Population increases and tastes of the people undergo a change.
2. Capital accumulation taken place leading to increased productivity.
3. Technological change improves the methods of production and reduce the cost of production.
4. Firms of industrial organization will change. and
5. Human wants not only change but also multiply.

Due to these changes, there will be divergence between costs and prices and the entrepreneur will earn profits. If an entrepreneur can correctly anticipate these change he will earn positive profits other wise suffer losses.

26.9.3 Innovations and Profits.

Joseph schumpeter attributes profits to the introduction of innovations. He believes that in order to earn profits an entrepreneur will always be innovating. Innovation is usually meant to be a technological progress or resource discovery. However schumpeter defines innovation as including any of the following activities.

- (i) Introduction of a new good;
- (ii) Introduction of a new method of production;
- (iii) Opening of new market;
- (iv) Conquest of the new source of supply of raw materials; and
- (v) Changing organization of any industry like the creation of monopoly position.

The entrepreneur by channelising resources to these activities, leads in generation of profits and in a sense provides leadership to a set of changes in the economy. An innovator need not necessarily be an entrepreneur. He may be anybody in business. He is a person who keeps on trying to carry out new activities, he is a man with vision, originality and creative. To put it in common parlance, he is a creative human being who is always willing to experiment new things. However, an innovator may not be successful in all his attempts. But when he succeeds, he is rewarded with a huge profit.

Schumpeter says that such profits will not be permanent. A successful innovator has only an initial advantage. Once the other entrepreneurs start imitating him, after some time the profits will be reduced. Thus schumpeter treats profit as a dynamic surplus.

26.9.4 Hawley's Risk Bearing Theory

Business is subject to different kinds of risk. Entrepreneur's main function is to bear risks associated with organization of factors and production. Hawley opines that profit is a reward for this risk bearing function of the entrepreneur.

Hawley mentions four common types of risks-replacement, obsolescence, risk and uncertainty. When and at what rate the machinery is getting outdated when it is to be replaced and what will be the cost of replacement are some formidable challenges faced by all the entrepreneurs which can never be calculated. Further, it is also impossible to visualize the rate and quality of technical progress and hence the obsolescence of the existing technology. Other than these two, the entrepreneur also has the risk of marketability of the product-change in tastes and fashions, entry of new firms etc. These are known factors or foreseeable risks. But there are few unforeseen changes, which make the entrepreneur not possible to adjust or go according to his plans.

Unless there is someone who can bear these risks, production will not be forthcoming. Entrepreneur bears these risks and is rewarded in the form of profit. Since the risk element implies possibility of losses, the risk bearer earns a premium in terms of profit.

However, Hawley's theory has been criticized. TN carver argues that profit accrues because the entrepreneur avoids risk with the use of his

business skill and therefore, profit is a reward for risk avoidance rather than risk-bearing.

Similarly FH knight argues that profits are not due to risks which can be foreseen and therefore insured against. He stresses that profits are for facing uncertainties which are not foreseen and therefore non-insurable.

Despite these criticisms Hawley identified the risky nature of business and profits associated with it.

26.9.5 Profit as a Reward for uncertainty Baring

Frank Knight's theory of profits which postulates that entrepreneur bears uncertainties related to production and profit is a payment for uncertainty bearing has received wide acceptance.

As we have indicated before the risks can be classified into 'insurable' and 'non-insurable' risks. Certain risks like fire, death, theft etc are foreseeable and can be covered by insurance. Here, the entrepreneur shifts the risks to an insurance company by paying a pre-determined premium. There is the second category of risks that are unpredictable and hence non-insurable. These are called as the uncertainties the entrepreneur alone has to bear these uncertainties and the entrepreneur earns profit for this function.

Knight distinguishes between four types of uncertainties:

1. Competitive uncertainties that emerge due entry of new firms and products.
2. Technological uncertainties that emerge due to wearing and obsolescence of machinery.
3. Cyclical uncertainties which a rise due to cyclical fluctuation in market economies.
4. Policy-induced uncertainties emerging from the changing policies of the government.

The entrepreneur cannot predict what would happen to his business owing to any of these factors and he is not in a position to hedge against these.

Uncertainty bearing, therefore is productive and has a demand. The supply price of the desire to bear uncertainty is the profit.

Self-Assessment Question.

- (i) Write a few words differentiating risk and uncertainty.
- (ii) Cite a few examples of schumpeterian innovations.

Some economists like kalecki argue that profits arise due to monopolistic elements in the market and the amount of profit varies directly with the monopoly power.

An attempt is also made to apply the marginal productivity theory as described earlier in this and the previous units to the determination of profits.

Thus, what you observe is the existence of many theories to explain the emergence and determination of profits. The theories individually touch a single aspect of profit determination. It is in this context that Keirstad tried to synthesize the various theories of profit.

He states that profits arise due to entrepreneurial activity which is based on expectations about the uncertainties in the dynamic conditions of the economy.

26.9.6 Conclusion.

As you have studied, profits are in the nature of surpluses which the entrepreneur earns for making the right guess about the changes that occur and take the risk of organizing other factors of production. He also earns profit as he does things differently attracting more number of customers to him.

Review Question.

1. Why does Clark think that an economy is continuously changing?
2. What are the different types of risks identified by Hawley?
3. Distinguish between insurable and non-insurable risks.

Key-words:

1. **Rent:** A payment made for the use of land or buildings.
2. **Differential Rent:** The differential earnings of the best grade land over the next grade land.
3. **Scarcity Rent:** Payment made for factors of production that are limited in supply (scarce).
4. **Economic Rent:** A payment for the services of an economic resource which is not necessary as an incentive for its production.
5. **Transfer earnings:** The amount any factor of production could expect to earn in its best alternative use.
6. **Quasi Rent:** Payment made for a factor whose demand increases because of its limited supply in the short run.
7. **Interests:** Price paid for the use of capital. Economists have defined the concept of interest differently.
8. **Savings:** The excess of income over consumption.
9. **Loanable Funds:** Funds available for lending which includes savings, disordered balance and net addition to the amount of bank credit.
10. **Liquidity:** The property of assets of being easily converted into liquid cash rapidly and at a fair predictable price. Apart from money itself, deposits in the bank, short dated securities are the main liquid assets.
11. **Liquidity preference:** The factors determining the amount of money (liquid cash) people want to hold.
12. **Transactionary motive:** The desire to hold cash balance in order to carry on day-to-day transactions.
13. **Speculative motive:** The desire to hold cash balances in order to get the benefits of changes in the rate of interest.
14. **Precautionary motive:** The desire to hold cash balances for meeting exigencies.
15. **Profits:** The reward for the entrepreneur who organizes the factors of production and bears the risks associated with the process of production.
16. **Surplus:** The excess of total sales revenue going to producers over total costs of production.
17. **Dynamism:** Dynamism refers to generic changes that constantly take place in an economy such as changes in population, Capital accumulation & technological changes.

18. **Risk-insurable and non-insurable:** Foreseeable risk such as fire, death and theft that can be covered by insurance are called Risk-insurable. Unpredictable and hence can not be covered by insurance are called non-insurable risks that are also called uncertainties.
19. **Innovation:** The economic application of a new idea. Product innovation involves a new or modified way of making a product.
20. **Monopoly profits:** An excess of profits over the normal rate which a firm is able to make by exploiting a monopoly position.

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Unit 27: Macro Theories of Distribution

- 27.1 Objectives
- 27.2 Introduction
- 27.3 Ricardo's Theory of Distribution
- 27.4 Marx's Theory of Distribution
- 27.5 Kalecki's Theory of Distribution
- 27.6 Kaldor's Model of Distribution
- 27.7 Let Us Summarise

Unit 27: Macro Theories of Distribution

27.1 Objectives:

After going through this section, you should be able to:

- (i) Understand the difference between theory of factor pricing and macro-distribution;
- (ii) Assess contributions of Ricardo, Marx, Kalecki and Kaldor to macro distribution; and
- (iii) Various theoretical developments to determine the prices of individual factors of production.

27.2 Introduction

The problem of distribution is looked at as an extension of pricing of output to inputs in the neo-classical theory. The neo-classical thinkers attributed qualitative importance to the distributive issues mainly because it essentially addressed the opposite interests of two classes of people-wage earners and capitalists. The classical thinkers too attached greater significance to the theory of distribution especially to the relative roles of social classes.

In this context, the distribution was discussed in a macro economic sense and was related to growth of the economy and consequent shares of these classes.

In this unit you will study four macro theories of distribution viz Ricardian, Marxian, Kalecki's and Kaldor's theories.

27.3 Ricardo's Theory of Distribution.

In the previous unit you have learnt about Ricardo's theory of rent as a part of factor pricing. In that, we were interested in determining the rent of land alone in a static context and now let us consider the possible changes that occur in the economy and its consequent impact on the shares of other factors.

As population increases, less fertile land is brought under cultivation. The operation of the law of diminishing returns suggests that the marginal product of each additional worker is lower. Consequent to decreased growth in production but increased population, the price of corn increases and so

does the rent per unit of corn output. Given the above relationships, the total physical product curve will be concave to the horizontal axis as shown in figure 27.1.

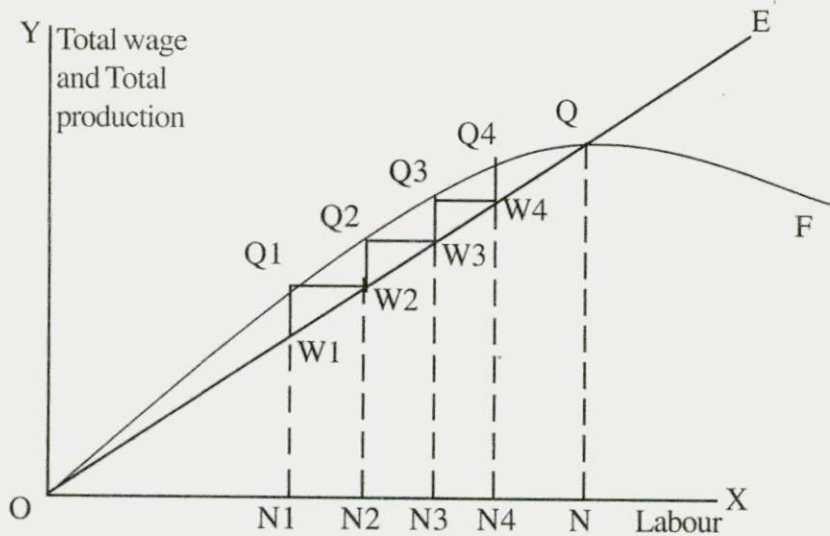


Figure 27.1 Ricardo's Theory of Distribution.

The OF curve indicates that increased employment will result in proportionately smaller increases in total product coming to wages. Ricardo had two concepts of wages. Firstly natural or subsistence wage based on the Malthusian theory of population and secondly, the market wage which prevails in the economy at any point of time. The market wage is a function of the level of accumulation, i.e., higher the rate of capital accumulation, greater will be the competition for workers and therefore higher will be the wage. As far as subsistence wage is concerned, if we assumed that subsistence wage is constant overtime, the wage bill will be represented by a straight line like OE in the figure 27.1.

Given these, let us study the dynamics of distribution. Initially assume that the labour force is ON1 at which the wage bill on subsistence basis, will be N1W1. Profits will be Q1W1 and the rate of profit $Q1W1 / W1N1$. The profit will be reinvested and as a result market wage moves up to N1Q1. Since market wage is higher than the subsistence wage, population increases and so does the labour force pushing down the wages to subsistence level N2W2 at the labour force level of ON2.

The profits will now be $Q2W2$ and profit rate $Q2W2 / W2N2$. Once again investment and accumulation take place driving up the market wages and promoting further increase in population and labour force. So that wage rate again falls down to subsistence level. You observe that as this process continues the profit and profit rate continue to fall and at Q the profits are nil even if the wages are at subsistence level.

At Q wages absorb the total product. This is the stationary state in which neither capital nor population will grow as there is no motive for accumulation.

The above discussion assumes fairly quick adjustment between wage rise and population which is not so. Because of the slower rise in population than the market wage there will be some difference between market wage and subsistence wage leading to generation of profit and accumulation. Moreover the experiences of the industrial countries do not support the Ricardian conclusion regarding the stationary state.

According to Pasinetti, population is exogenously given and not wage determined; technical progress has wiped away the decreasing returns; and constant or increasing returns to scale prevail in an economy.

These phenomena have questioned the Ricardian proposition that profit rate falls with economic growth of countries.

Self-Assessment Questions:

1. Examine the important assumptions involved in Ricardo's theory of distribution.
2. Trace the occurrence of 'Stationary State' in Ricardo's model.
3. Differentiate between market wage and subsistence wage.

27.4 Marx's Theory of Distribution.

Marx considered distribution under capitalism where the means of production are owned by a minority group who employ workers by paying wages. This minority group appropriates to itself a large part of the output as profits. According to Marx, in such a system the problem of distribution is not a matter of technical relations but the issue of the ownership of the means of factors of production. Marx was interested in the source of profits and its appropriation by the capitalists.

Like Smith and Ricardo he also assumes that labour is paid a subsistence wage. The existence of reserve army of unemployed workers waiting for work always keeps the wage at subsistence level. Similarly like Ricardo, Marx also gives importance to accumulation by the capitalists. However, while in Ricardo's analysis accumulation is a function of the rate of profit, Marx attributes it to competition among the capitalists. According to Marx capitalists have to accumulate in order to survive. In Marx analysis also profit rate falls as accumulation increases but it is due to rapid increases in the ratio of constant variable capital as compared to the increases in the rate of surplus value. While for Ricardo the consequence of capital accumulation was a 'Stationary State' to Marx, it was the collapse of the capitalist system.

Given the above basic comparison of Marx and Ricardo's theories. let us now study in details the theory of distribution of Marx.

Marx espouses his model as follows:

$$r = \frac{S}{C+V} = \frac{S/V}{(C/V) + 1} = \frac{S1}{K+1}$$

Where r = rate of profit

C = Constant capital

V = Variable capital

S = the surplus value

(S/V = S) = the rate of surplus value or exploitation rate

K = organic composition of capital

Marx believed that in the long run, the rate of profit will fall. The rate of exploitation or the rate of surplus value is assumed to be constant. You will notice that since the organic composition of capital-the proportion of constant to circulating capital-is thought to be increasing overtime, the profit rate should decline. Elaborate Marx's viewpoint as: An increase in the organic composition of capital is associated with a fall in the number of workers employed with given capital. Hence even if there is a substantial increase in the rate of surplus value, the total quantity of surplus value on the given capital must eventually fall below the original level. Even if the organic composition of capital increase the rate of profit declines but the rate of surplus value increases.

Thus, Marx is of the opinion that with accumulation of capital the rate of profit as well as the rate of surplus value or exploitation increases. Hence the shares of labour decline relative to that of capital.

Self-Assessment Questions:

1. Write a note on the concept of surplus value or exploitation as propounded by Marx.
2. Compare Ricardian and Marxian theories of distribution.

27.5 Kalecki's Theory of Distribution

Michael Kalecki states that the profit is a function of the degree of monopoly of an enterprise. This proposition is subsequently generalized for the whole economy.

Kalecki realized that perfect competition is irrelevant and assumed that excess capacity is a normal feature of a capitalist enterprise. As a consequence production is believed to take place largely under conditions of decreasing or constant marginal cost conditions. He assumes L-shaped cost curve so that average average variable costs (AVC) will be constant and the short run marginal and average costs will be equal over a long range up to capacity output. He also assumes that price is determined by the full cost principle that is by adding up a mark-up to prime costs which consist of profits, inclusive of dividends plus overhead costs such as interest, depreciation and salaries.

Now let us turn to Kalecki's model. The formula for mark-up pricing for a single firm can be expressed as

$$P = K \cdot AVC \text{ ————— } 1$$

Where P is the price and K the ratio by which the variable costs are marked up that is

$$K = \frac{\text{Aggregate proceeds}}{\text{Aggregate VC}} = \frac{W + R + O + E}{W + R} \text{ ————— } 2$$

Where, W is the wagebill, R is the cost of raw materials, O the total overheads (FC) and E, the aggregate entrepreneurial income including dividends. From the above we have,

$$O + E = (K - 1)(W + R) \text{ ————— } 3$$

Where the left hand side of the equation shows the sum of overheads and profits. Now let A be the value added by the production process. Therefore

$$\begin{aligned} A &= W + O + E \\ &= W + (K - 1)(W + R) \text{ ————— } 4 \end{aligned}$$

$$\begin{aligned} \text{There fore } \frac{W}{A} &= \frac{W}{W + (K - 1)(W + R)} \\ &= \frac{1}{1 + (K - 1)(1 + R/W)} = \frac{1}{1 + (K - 1)(1 + J)} \text{ ————— } 5 \end{aligned}$$

Where $J = R / W$

Equation 5 indicates that the share of wages in national income is a function of two variables. K and J (the ratio of costs of raw materials to the wage bill).

In pure competition, price is equal to the short run marginal and average costs of production. Therefore, in such markets $K = 1$. But in markets which deviate from pure competition, K will be greater than one. The more imperfect the market, the greater will be the gap between price and marginal costs, and consequently the greater will be K. Therefore, K is presumed to represent the degree of monopoly in the market. The wages in the national income will be higher, the lower is the degree of monopoly and the lower is the ratio of raw material costs to wage costs.

Like Marx, Kalecki believed that, overtime, there will be a growing concentration of industry, so that K will be an increasing function of time. This will tend to depress the share of wages in the national income. But through exploitation in poorer nations the terms of trade of agricultural products

vis-à-vis manufactured will witness a secular fall and hence the wage share will remain stable overtime.

However, Kalecki's own empirical testing of his theory has had many pitfalls. Moreover, it is difficult to indicate the extent of imperfection in a market by the degree of monopoly.

But Kalecki's theory remains intuitively appealing one. Kaldor opines that Kalecki's hypothesis relates the distribution of income between wages and profits to the extent of competition in the prevailing market structure.

Self-Assessment Question.

Evaluate Kalecki's theory of distribution.

27.6 Kaldor's model of distribution

Unlike Kalecki's model which uses a micro economic concept to explain a macro economic phenomenon, Kaldor presented a full fledged model that uses the concepts of aggregate investment, savings and income to explain the distribution of income. The model assumes full employment. Investment is determined by the state of confidence rather than the distribution of income. There are two income categories: wages and profits. Wages include payment to manual labour as well as salaries. Profits include return to entrepreneurs and income of property owners. The average and marginal propensities are assumed to be the same. But propensity to save out of wage income is small relative to that of profit income.

With these assumptions, Kaldor attempts to establish the constancy of relative factor shares and the capital output ratio. The model can be expressed using the following symbols.

Y	=	aggregate income
W	=	wage bill
Sw	=	average and marginal propensities to save out of wage
P	=	profits
Sp	=	average and marginal propensities to save out of profits
I	=	investment
S	=	savings
Sw	=	aggregate savings out of wage income = Sw. W
Sp	=	aggregate savings out of profits = Sp. P

Now

$$Y = W + P \quad \text{-----} \quad 6$$

In equilibrium $I = S \quad \text{-----} \quad 7$

And $S = S_w + S_p \quad \text{-----} \quad 8$

Substituting equation 8 and 7, we get,

$$\begin{aligned} I &= S_w + S_p \\ &= S_w \cdot W + S_p \cdot P \quad \text{-----} \quad 9 \\ &= S_w (Y - P) + S_p \cdot P \\ &= (S_p - S_w) P + S_w Y \end{aligned}$$

Dividing both sides by Y, we get

$$\frac{I}{Y} = (S_p - S_w) \frac{P}{Y} + S_w$$

There fore

$$\frac{P}{Y} = \frac{1}{S_p - S_w} - \frac{1}{Y} - \frac{S_w}{(S_p - S_w)} \quad \text{-----} \quad 10$$

Since by assumption, S_w and S_p are constants, equation 10 shows that the share of profits in the national income is a direct function of the share of investment in the national income.

To clarify this further it is assumed that $S_p > S_w$. In equilibrium $S = I$. If the ratio of investment (I) to national income (Y) increases, this equality is disturbed. Prices will rise and the share of profits in Y will increase relatively to the share of wages. Since $S_p > S_w$, the aggregate savings continue to rise until they are equal to the aggregate exogenous I . In this model, an increase in the rate of I cannot increase Y because of the assumption of full employment. Therefore, the only way by which that savings can be brought into equality with the increased investment is through a change in the distribution of income in favor of profits and away from wages.

Thus overtime, the share of capital increases and that of labour declines. The importance of Kaldor's model is that by emphasizing savings and capital stocks he takes the analysis back to the fundamental determinants of the economic system.

The theory was later modified by Pasinetti and Kalecki. The influence of trade unions on wage determination and consequent distribution of income. However the thesis that the relative income distribution will be in favour of capital is supported.

Self-assessment Questions.

1. Explain Kaldor's model of distribution.
2. What is your comment regarding the thesis that overtime distribution favor capital rather than labour.

27.7 Let Us Summarize

The macro theories of distribution are more directed towards how the income is shared between capital and labour at the macro level rather than determination of the factor prices. Their purpose is to identify factors that can promote growth without creating much rift between capital and labour.

Ricardo's model derived from classical economic theory of growth and distribution, concludes that accumulation of capital leads to employment of labour but the rate of profit declines till the rate of profits equals the subsistence wage, it becomes zero. Then the economy reaches a stationary state. Karl Marx identified that with growth the quantity of surplus value declines and because of this reason, the rate of surplus value, defined as the rate of exploitation of labour increases. Kalecki also with many deviations from the classical assumptions concluded that the share of wages decline and the rate of mark-up which includes price increases. This increases the capitalist share in income. Finally Kaldor gives much more elaborate theory using Keynesian concept and the conclusion is almost the same that the share of wages will decline relative to capital.

Review Questions:

1. What is the significance of macro theories of distribution?
2. Account for the reduction in the relative share of wages in the income overtime.

Key-words:

1. **Natural or subsistence wage:** The lowest level of wages consistent with the survival of the labour force. This is an ambiguous concept, meaning either wages sufficient for individual labourers to survive for some limited period, say a year or a wage level sufficient for the workers and their families to have the expectation of life normal in their societies. In modern societies subsistence wage is a term of abuse rather than a definite quantity.
2. **Stationary state:** Ricardian concept referring to a state in which neither capital nor population will grow as there is no motive for accumulation.
3. **Reserve army:** Marxian concept referring to an army of unemployed workers waiting for employment which keeps the wages at subsistence level.
4. **Surplus value:** The excess of what workers can produce over what they need to consume. Marx believed that surplus value would be appropriated by capitalists which is called exploitation.
5. **Organic composition of capital:** The proportion of constant capital to circulating capital. Marx believed that an increase in the organic composition of capital is associated with a fall in the number of workers employed with given capital.
6. **Rate of exploitation:** The rate of surplus value appropriated by the capitalists or producers. Surplus value should essentially be divided between various sections of the society. But Marx believed that it would be appropriated by capitalists.
7. **Mark-up:** The excess of the selling price of a product over the cost of making or buying it. The mark-up on any product has to cover the overheads of the firm, as well as providing a profit margin.
8. **Degree of monopoly:** The ratio of costs of raw materials to the wage bill. The more imperfect the market is, the greater will be the gap between price and marginal cost and consequently the greater will be the degree of monopoly.
9. **Propensity to save:** The proportion of disposable income which individuals do not desire to spend on consumption. The sum of the propensity to save and the propensity to consume, average or marginal is always 1. Propensity to save out of wage income is small relative to that of profit income.

References:

G.C. da Costa: Production, Prices and Distribution, Tata Mc-Graw Hill Co-Ltd, New Delhi, 1985.

NOTES

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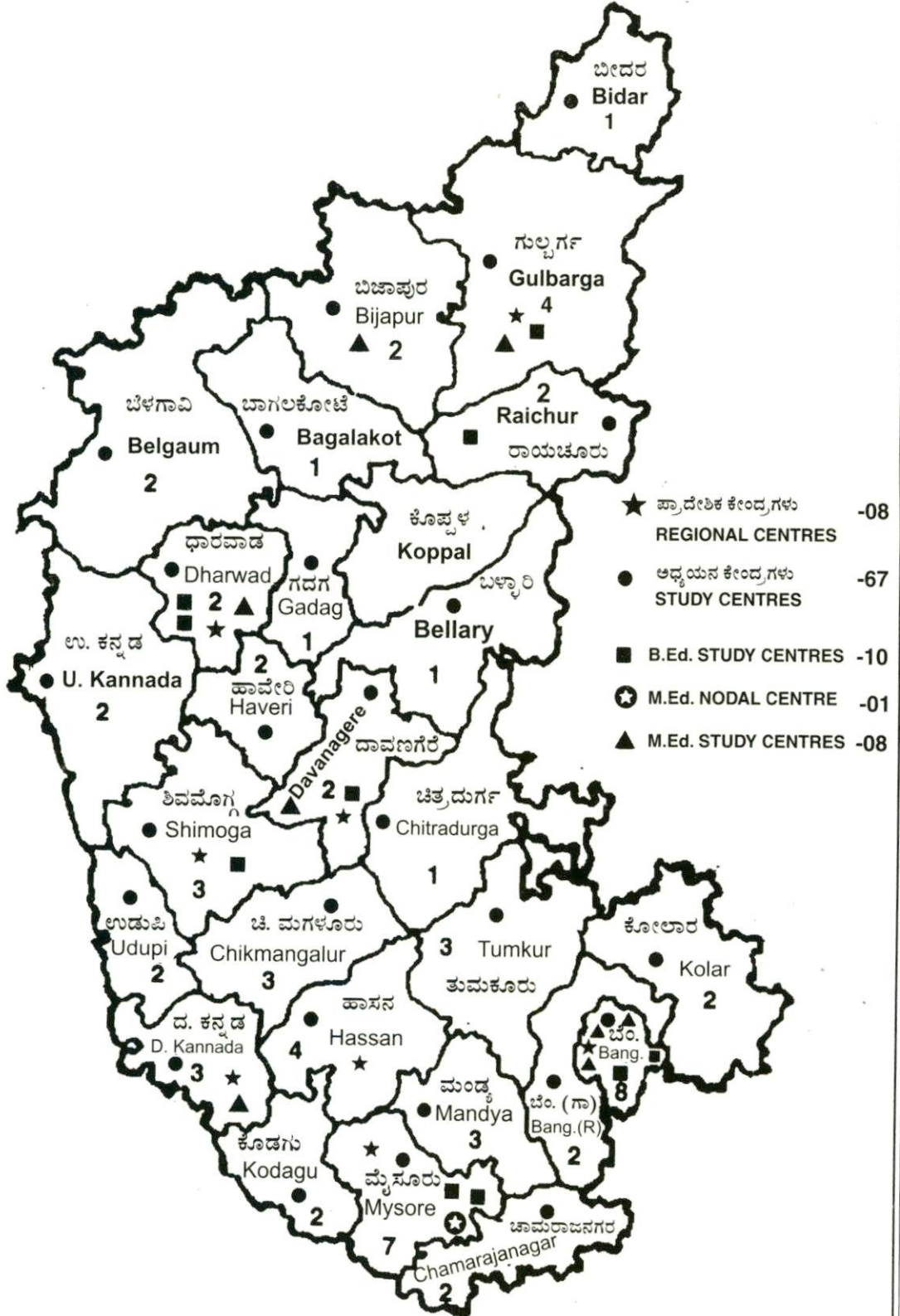
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